

SHIP AND BOAT BUILDING TERMS

Glossary: A collection of lists and explanations of abstruse, obsolete, dialectical or technical terms.

O.E.D.

Reference Document: *Modern Shipbuilding Terms* F. Forrest Pease, J. B. Lippincott Company

This glossary gives definitions of many (but by no means all) of the ship/boat construction terms the marine surveyor will find. They relate to the hull only and are mainly those that the author learned when he was an apprentice shipwright. They include some very ancient ones and a few that are now obsolete but were still in use, again, when the author was a shipwright. The glossary is not confined to words used on small wooden or metal pleasure boats as it includes words relating to the construction and survey of vessels built of other materials and also many words relating to the commercial vessels that come within the small craft definition such as barges, coasters, small bulk carriers, tugs and trawlers, dredgers *etc.* It is useful to include such of these definitions as are appropriate as an appendix to any report prepared by the marine surveyor for expert witness or other legal purposes. The reference document above gives a number of terms not found in this glossary as it is aligned to big shipbuilding rather than small craft. It is, nevertheless, a useful addition to the marine surveyor's library. Where American terms are known by the author to be different from the British both are given. Words specific to frp boats, canal boats and ferrocement are given in other glossaries in the relevant chapters above.

<i>A Bracket</i>	British Admiralty (inaccurate) name for a <i>V Bracket</i> . See <i>Shaft Bracket</i> .
<i>Abaft</i>	A location toward the stern of the vessel with reference to another point.
<i>Abeam</i>	At a right angle off the beam to either the starboard or port side of the vessel but not on the boat.
<i>Aboard</i>	On or within the vessel.
<i>Above Deck</i>	On the deck but not over it - see <i>Aloft</i> .
<i>Abreast</i>	Side by side or alongside the vessel or broad off her beam.
<i>Adrift</i>	Loose, not on moorings or towline, unsecured.
<i>Accommodation Ladder</i>	A portable set of steps on the side of a ship for the use of people when boarding the vessel from small boats or a pier.
<i>Aerosol</i>	A term used for a broad range of solid or liquid particles suspended in air or, in some special cases, other gases and includes many other more commonly used (and misused) terms such as dusts, fumes, fogs, mists and smokes but does not include gases or vapour.
<i>Aft</i>	Towards the stern part of or abaft the vessel.
<i>After Body</i>	Also Aftership. The hull of the vessel abaft the <i>Midship Section</i> . (q.v.). That part of the ship's body abaft the midships or dead-flat. The term is, however, more particularly used in expressing the figure or shape of that part of the ship.

<i>After Peak</i>	The compartment in the narrow part of the vessel abaft the aftermost transverse watertight bulkhead. Usually in the form of a tank used for water ballast but which should not be used for drinking water.
<i>After Peak Bulkhead</i>	The first main transverse watertight bulkhead forward of the stern.
<i>After Perpendicular</i>	The after side of the stern post or centreline of the rudder stock and Station 0 on the <i>Lines Plan</i> (q.v.) where it is designated A.P.
<i>Ahead</i>	A term used to describe the sea area in front of the vessel.
<i>Air Draught</i>	(A _d) is measured from the water line to the highest point on the vessel left above the waterline when all portable or moveable equipment is dismounted or folded down flat.
<i>Air Gap</i>	A small gap left at the top and bottom of otherwise close fitted lining or ceiling to facilitate air circulation between the frame timbers and into the bilge space of wooden boats. Sometimes called an Air Funnel.
<i>Aloft</i>	Above the deck, up the mast(s) or in the rigging.
<i>Amidships</i>	In midships or in the middle of the ship, either with regard to her length or breadth. Hence that timber or frame, which has the greatest breadth and capacity in the ship is denominated the <i>Midship Bend</i> (q.v.).
<i>Anchor Hold</i>	The hold of an anchor upon the ground.
<i>Anchor Lining</i>	The short pieces of plank fastened to the sides of the ship or to stanchions under the fore channel to prevent the bill of the anchor from tearing the ship's side when fishing or drawing up the anchor. It was only used in the Royal Navy and many ships upon which it was fitted have lately had it taken away. Also called a <i>Bill Board</i> (q.v.).
<i>Anchor Winch</i>	The horizontal hand or power operated machine in the bow area used for weighing anchor more correctly called a <i>Windlass</i> (q.v.).
<i>Anticavitation Plate</i>	A curved plate fitted over the propeller on many Dutch barges to prevent the propeller drawing air down from the water surface.
<i>Anti-trip Chine</i>	A flared out after section of the side/bottom of a planing hull. Its purpose is to prevent the hard chine of the boat catching a wake or small wave on a sharp turn.
<i>Appendage</i>	Any part of the vessel's structure attached to and extending beyond the moulded surface or, in the case of a metal vessel, the exterior of the shell plating.
<i>Apex Line</i>	An American term for the lowest point in a cut rabbet where the inside faces of the planking end. In profile, it lies between the rabbit and bearding line and is sometimes called the Middle Line.
<i>Aperture</i>	The opening in a cast stern frame between the propeller post and the rudder post and the area within which the propeller turns.

<i>Apron</i>	A primary main vertical structural timber fitted immediately behind the stem, bolted to it and sitting on top of the forward deadwood. The apron is sometimes called the Stomach Piece. The plank forward ends are hooded to it. A similar timber is fitted inside and bolted to the stern post and is called the Inner Stern Post. The latter sits atop the after deadwood and the plank after ends are hooded to it.
<i>Apron Board</i>	An American name for the <i>Covering Board</i> (q.v.).
<i>Apostle Timber</i>	See <i>Knighthead</i> .
<i>Arch</i>	The upper under inner side of a cast stern frame. See <i>Aperture</i> .
<i>Arch Board</i>	The curved top of a <i>Transom</i> (q.v.) as it extends above the deck line or <i>Cutch Timber</i> (q.v.).
<i>Arch Knee</i>	A knee sometimes fitted at the head of the stern post to support the <i>Horn Timber</i> (q.v.).
<i>Arris Cut</i>	Also <i>Syphering</i> (q.v.). This term is applied when the edges of planks are cut to an under bevelling to fay one upon another usually found at the <i>Berthing</i> (q.v.).
<i>Ashcroft Build</i>	A method of diagonal double planking the skin of a vessel such that both Palings and Wrappers rake in the same direction with the seams of the palings at half the width of the wrapper boards. See <i>Double Diagonal Build</i> . Both wrappers and palings are of the same thickness..
<i>Aspect Ratio</i>	The ratio between the chord of a foil and its breadth.
<i>Astern</i>	In the after end of a vessel or a location off the vessel and behind it.
<i>Athwartships</i>	Horizontally perpendicular to fore and aft <i>i.e.</i> square to the vessel's centreline.
<i>Backbone</i>	The spine of the hull consisting of the keel, hog and keelson from which the transverse timbers (frames) radiate.
<i>Back Rabbet</i>	An American term for the surface of the apron or inner stern post to which the skin plank ends fay. Usually, in the United Kingdom, called the <i>Hood</i> . (q.v.). See Figures 128, 129, 137 and 138. Also the innermost angle or rabbet line in which the garboard strake is set into the keel or any rabbet cut to receive planking at any other than a right angle.
<i>Back of Stern Post</i>	A separate piece of timber attached to the after side of large scantlinged stern posts (rare).
<i>Badge</i>	Decorative, highly painted, carved wooden pieces often fitted on either bow, usually representing the burgee of the Owner's yacht club.
<i>Badger Board</i>	An external non structural item fastened horizontally across the outside of a <i>Transom</i> (q.v.) at the waterline level to prevent damage and wear to the transom and after planking. Sometimes called a badger strake or badger rail.

<i>Bailers</i>	Openings in the bottom or transom of a boat to drain water when sailing.
<i>Ballast</i>	Heavy solid material fitted at the bottom of a boat which has the dual purpose of lowering her centre of gravity and increasing her metacentric height. It can be lead, iron, concrete, <i>etc.</i> depending on the space available and the amount needed and may be either a solid shaped casting or in the form of loose ballast pigs. It may be water in a double bottom or similar tank.
<i>Ballast Keel</i>	A piece of solid cast iron or lead shaped to fit and be bolted to the normal keel usually but not necessarily of a sailing vessel. See <i>Keel</i> .
<i>Ballast Ratio</i>	The ratio of the weight of the ballast to that of the hull (displacement). Often taken as a measure of the comparison of a boat's stiffness but should only be applied if two boats are of the same form. The ratio can be misleading.
<i>Barcol Hardness</i>	A measure of the resistance of material to indentation by a spring loaded indenter. The higher the number, the greater the resistance and the harder the material. Normally used on frp vessels to estimate the degree of cure of the resin. A similar test called the Shore Hardness test is used on rubber items.
<i>Barge</i>	Any non powered vessel solely used for the carriage or cargo. Also called a lighter. There are many types. Dutch and Belgian powered small river craft are also often called barges.
<i>Bar Keel</i>	See <i>Keel</i> .
<i>Bar Stem</i>	See <i>Stem</i> .
<i>Bathing Platform</i>	See <i>Swim Platform</i> .
<i>Batten</i>	A thin flexible length of timber. Also an American term for the interior longitudinal reinforcements in a boat hull such as the hog, chine bars, shelves and stringers. Also longitudinal timbers used to form the side and bottom seams of some hulls.
<i>Batten Studs</i>	The iron clips on the sides of a barge's hatch coamings which are fitted with wedged steel battens to secure the hatch tarpaulins or cloths.
<i>Bay</i>	The space between two adjacent transverse side frames or bulkheads.
<i>Beach Garboard</i>	A name given to an extra thick garboard wale when fitted to a vessel regularly hauled out on a beach.
<i>Beakhead</i>	A light structure in old wooden ships forward of the hull and under the bowsprit. Obsolete. Also a name for the <i>Fiddlehead</i> (q.v.) or <i>Billethead</i> (q.v.). The top platform of the beakhead in Classical Greek times was called the <i>Prow</i> (q.v.). Greek <i>πρώϊα</i> .
<i>Beam (Breadth) (1)</i>	The maximum breadth of the vessel and has three main forms: - i. <i>Beam or Breadth Overall</i> (B_{OA}) is the widest point of the vessel's structure including all wales, chain plates, rubbing

strakes and similar items wherever it occurs on the hull above or below water.

- ii. *Beam or Breadth Moulded* (B_M) on a wooden, frp or ferro cement vessel is the maximum beam (or breadth) of the exterior surface of the vessel excluding any wales, rubbing strakes, harpins or similar items. On a metal vessel the moulded beam (or breadth) is the maximum breadth to the exterior of the frames inside the side shell plating.
- iii. *Bottom Breadth* (B_B) is measured on flat bottomed canal boats only and is measured across the bottom from the outside of the outer chine bar or angle or the wear strip as appropriate to the same point on the other side of the hull.

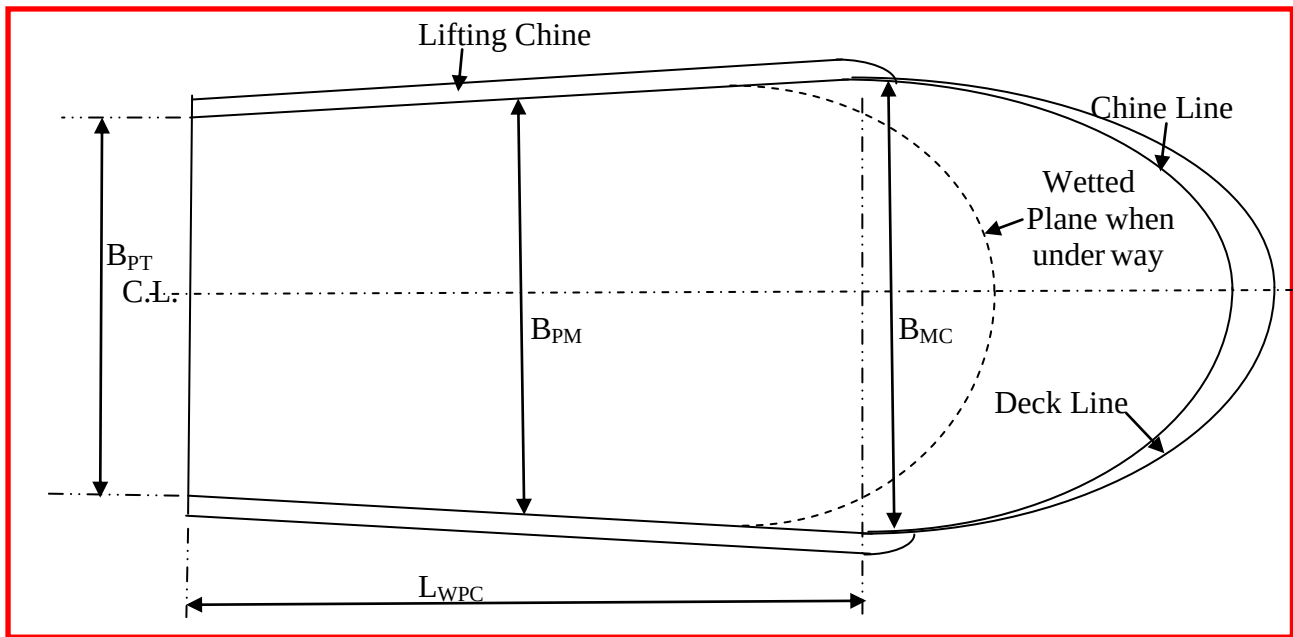
When not otherwise defined the beam is the breadth moulded (B_M) of a ship, measured amidships at the design waterline. According to the position where the beam or breadth is measured, it called: -

- i. *Beam or Breadth, Maximum Immersed* (B_{MI}) which is the maximum beam of the underwater body. Also called the *Beam, Waterline*. (B_{WL})
- ii. *Beam or Breadth, Maximum Section* (B_X) which is the beam measured on the designed waterline at the maximum section area.
- iii. *Beam or Breadth, Midlength* (B_{ML}) which is the beam at the midsection of the hull at the designed waterline.

Very often these measurements are identical.

For a hard chine hull the beam refers to the breadth of the planing bottom. See the sketch below. According to the position where it is measured, it is called: -

- i. *Beam or Breadth, Maximum over Chines* (B_{MC}) which is the maximum breadth over the chines excluding any external lifting chines.
- ii. *Beam or Breadth, Mean over Chines* (B_{PM}) which is the mean breadth over the chines and is defined as the ratio of the wetted planing bottom area (A_P) and the projected wetted chine length (L_{WPC}).
- iii. *Beam or Breadth, Transom Chine* (B_{PT}) which is the breadth over the chines at the transom excluding any external lifting chines.



Definitions of a Planing Bottom

<i>Beam (2)</i>	A primary supporting structural transverse member fitted to support a deck and a load applied transversely to it and supported, in turn, in a wooden vessel by a longitudinal member called the beam shelf and in a metal vessel by brackets (called beam brackets or knees) attached to the tops of the side shell frames.
	Width generally. Usually the widest point on the hull but may be given at any point in the hull.
<i>Beam Bracket</i>	A plate joining the beam to the side frames and, strictly only found on metal boats. See <i>Knees</i> .
<i>Beam Knees</i>	See <i>Knees</i> .
<i>Beam Mould</i>	A pattern or template used for marking the shape or camber of deck beams.
<i>Beam Shelf</i>	The primary supporting longitudinal timber fitted to port and starboard and running from inside the apron to the inside of the inner stern post or transom as appropriate. Its foremost purpose is to support the outer ends of the deck beams. In America called the <i>Clamp</i> . (q.v.). In wooden barges it is called the <i>Inwale</i> (q.v.).
<i>Bearding</i>	The reduction in the siding at the leading edge of the stem to make a smoother <i>Cutwater</i> (q.v.).
<i>Bearding Line</i>	The line drawn through the points at which the inner surface of the planking cuts the surface of the apron or the side face of the keel.
<i>Bearers</i>	Tiercary transverse supports under a cabin sole or flat deck inside the hull.

<i>Bedding Compound</i>	One of a number of commercially available materials such as white lead (no longer legal) used to form a flexible but waterproof base in which to set fittings or as a luting material in certain joints. See <i>Luting</i> . (q.v.)
<i>Bed Logs</i>	An American name for the structural members of the centreboard case that run fore and aft and enclosing the centre board slot.
<i>Belly of the Deck</i>	See <i>Camber</i> .
<i>Below</i>	Beneath the deck or inside the boat.
<i>Belting</i>	A heavy wooden <i>rubbing strake</i> (q.v.) fitted to the outside of the sheer strake of a metal vessel.
<i>Bending (Steam)</i>	The process of forming curved wooden members by steaming or boiling the wood in a specially built box and then bending it to shape over a former.
<i>Berthing</i>	Light planking fastened to the outside of the timberheads to form a bulwark. Sometimes spelled birthing, In America called the <i>Waist Strakes</i> .
<i>Berthon Boat</i>	A folding dinghy invented by the Rev. E. Berthon in 1851 with longitudinal arcform frames running the full length of the boat and covered in canvas. The whole thing to fold into a flat pack.
<i>Bevel Board</i>	Piece of timber on which were marked the bevels of a frame flange to enable the anglesmith to fair the frame prior to erection.
<i>Bible Block</i>	A square or oblong piece of wood let into a piece of timber in place of a rotted or damaged area. Also called a Graving Piece. See <i>Dutchman</i> .
<i>Bilge (1)</i>	The lowest outward corner of the vessel's midship section or the lowest space within her at that point. i. The <i>Lower Turn of Bilge</i> is that point amidships where the flat of the bottom first starts to turn upward to form the sweep of the bilge. ii. The <i>Upper Turn of Bilge</i> is that point amidships where the sides of the vessel first start to turn inwards to form the sweep of the bilge. The sharper the turn of the bilge and the more acute the angle between the side and the bottom the firmer or harder the bilge is said to be. A bilge formed with an obtuse or shallow angle is said to be soft or slack.
<i>Bilge (2)</i>	The interior of the hull below the cabin sole or orlop deck.
<i>Bilge Bracket</i>	In a metal vessel a bracket (sometimes flanged) connecting the heel of a side shell frame to the outboard end of the associated floor plate.
<i>Bilge Boards</i>	Another name for twin bilge keels or for twin <i>Dagger Boards</i> (q.v.) set into the vessel's bilges.

<i>Bilge Futtock</i>	The frame futtock that covers the sweep of the bilge. See <i>Frame</i> .
<i>Bilge Keels</i>	Pieces of timber or bulb plates fitted normal to the vessel's skin or shell plating surface along the line of the bilge diagonal and designed to dampen out rolling motions. They are usually about one third of the vessel's length and sometimes called (anti) rolling chocks although, contrary to received opinion, they do NOT reduce the rolling. A number of frp built boats are designed with twin bilge keels instead of a deep central one and the keels are used to hold ballast. Such boats are generally slower than single keeled boats due to the extra wetted surface area and extra eddy making resistance.
<i>Bilge Plank</i>	An American term for the <i>Bilge Stringer</i> (q.v.) or <i>Bilge Wale</i> (q.v.).
<i>Bilge Radius</i>	The radius to which the bilge sweep is drawn and to which the supporting interior frames are curved.
<i>Bilge Strake</i>	The strake of plating at the turn of the bilge extending outward to the point where the ship's side rises vertically.
<i>Bilge Stringer</i>	See <i>Stringer</i> . In America called the bilge plank.
<i>Bilge Sweep</i>	The curvature of the bilge.
<i>Bilge Wale</i>	A thicker piece of skin planking laid along the line of the bilge and to which, usually, the bilge keels are secured.
<i>Billboard</i>	Extra timber (often English elm or oak) secured to the outside of the vessel's skin below the hawse pipes to take the wear of the anchor. Obsolete. See <i>Anchor Lining</i> .
<i>Billethead</i>	The American name for the forward extension of the stem head in place of a <i>Figurehead</i> (q.v.). See <i>Scroll Head</i> .
<i>Bimini (Top)</i>	A term applied to the extension aft of a wheelhouse top on motorboats. The true Bimini top is an open front canvas top for the cockpit of a boat usually supported by a metal frame and was invented in Warren, Rhode Island by Paul Johnson.
<i>Binnacle</i>	Formerly Bittacle. A wooden case, or chest, which contains the compass raising it to a convenient position and the lights to show them, by night. It is divided into three compartments with sliding shutters. Those at the side are fitted to hold a lamp which emits light through a pane of glass on each side on the compass in the centre compartment.
<i>Binding Strakes</i>	Sometimes called locking strakes, these are extra thick primary main structural deck planks checked into or across the beams to prevent the deck warping under transverse loads. Also the (obsolete) name given to extra thick planks in the skin and checked into or across the frames of wooden warships to prevent the skin warping when firing a broadside. In America the name is often applied to the <i>Landing Strake</i> (q.v.).
<i>Biological Attack</i>	This may take many forms but the most common are: -

- i. Grass, weed and crustaceans attaching to the shell of a boat of any type.
- ii. Barnacles are among the shellfish and crustacea which glue themselves to a vessel's bottom. There are several species. They do not damage the hull but increase a vessel's skin friction resistance remarkably.
- iii. In wooden boats attack by marine borers such as gribble or the shipworm.
- iv. In metal vessels microbiological attack by the iron bacterium (*Gallionella ferruginea*) or the sulphur reducing and oxidising microbes (*Desulfotomaculum* spp, *Desulfurovibrio* spp and *Thiobacillus ferrooxidans*). Also called *M.I.C.* (q.v.)

<i>Bitts</i>	A pair of stout wooden or steel bollards in tandem fitted forward and aft. Strong vertical timber or steel members fastened through the deck beams and used for securing ropes or warps. The tops of the fore bitts supported the windlass and are called the bittheads and were often faced or topped with copper or steel. See <i>Bollard</i> .
<i>Blackwall Caulk</i>	A scornful name for the (bad) practice of allowing a leaking boat to sit in a soft mud berth so that the mud is forced into and clogs the seams and so stops the leak.
<i>Bloom</i>	A swelling of the surface of a wrought iron plate due to internal delamination.
<i>Boat</i>	A fairly indefinite term. A waterborne vehicle smaller than a ship. One loose definition is that a ship may carry a boat but a boat cannot carry a ship.
<i>Body Plan</i>	A subsidiary drawing on the lines plan showing the curves of the vessel's transverse cross-sections upon which the water lines or water planes, bow and buttock lines and diagonal lines appear as straight lines.
<i>Bollard</i>	A single cast steel or large wooden post often waisted below the head and securely fastened to the vessel's deck to act as a securing point for the mooring lines. Also a wooden or iron post on a pier or quay or dockside for the same purpose.
<i>Bollard Timbers</i>	The aftermost of the forward primary main structural cant timbers and which often form a boundary to the collision bulkhead. The top timber of the unit extends upward each side through the covering board and on past the top of the bulwark cap rail in way and is shaped and fitted with a through bolt to form a mooring bollard.
<i>Booby Hatch</i>	See <i>Hatch</i> .
<i>Boot Topping</i>	The area of the vessel's sides between the load and light water lines. Also called the wind and water strakes. Sometimes a simple painted stripe that indicates the waterline.

<i>Bottom</i>	The area of the vessel's outer surface between the upper turn of bilge port to the upper turn of bilge starboard.
<i>Bottom Boards</i>	Portable gratings or loose boards forming the sole of a small dinghy or lifeboat. Also called <i>Futlings</i> (q.v.).
<i>Bottom Planking</i>	Planking between the outer edge of the garboard strake and the inner edge of the wrunghead wale or, these days, the inner edge of the bilge wale. Sometimes called the sand strakes.
<i>Bottom Shape</i>	As it affects performance in a planing boat. The maximum speed is achieved when the bottom of the boat that forms the planing surface is flat. When the planing surface is a vee, the boat will have a softer ride but a lower potential speed and will take longer to come up on to the plane.
<i>Boundary Bar</i>	An angle connecting the outer edge of a bulkhead to the inside of the shell plating on a metal boat and defining the shape of the vessel at that point.
<i>Bow(s)</i>	The vessel's area and spaces forward of the point where the sides begin to turn in toward the stem. The leading edge is sometimes, incorrectly, called the <i>Prow</i> (q.v.) by the press or yotties. Usually used in the plural. The word come from the low German dialect <i>boog</i> meaning shoulders.
<i>Bow Lines</i>	Lines showing the curvature and shape of a longitudinal section through the fore end of a vessel parallel to the vessel's centreline. The lines are called bow lines in the forward half of the vessel and continue to become <i>Buttock Lines</i> (q.v.) in the after half.
<i>Bow Platform</i>	An extension of the upper or fo'c'sle deck at the stem head usually only wide enough for one man to stand with the pulpit extended round it to form a platform to enable a seaman to handle the head sails and/or the anchor. May be moulded in on an frp vessel or a separate platform of wood or steel in vessels constructed of other materials.
<i>Bow Thruster</i>	An electrical motor driven propeller fitted in a transverse tunnel near the bows.
<i>Box Section Mast</i>	An American term for a hollow mast of round, square or rectangular section built from long strips of wood.
<i>Box Template</i>	See <i>Template</i> .
<i>Breadth</i>	See <i>Beam</i> (1).
<i>Breakwater</i>	A low upstanding ledge or coaming on the deck forward or near the cockpit intended to turn water overboard.
<i>Bream, to</i> (Verb)	To clear a ship's bottom of weeds, shells or other accumulated matter by burning and scraping it.
<i>Breast Hook</i>	In wooden vessels a strong tiercery piece of supporting structural compass timber connecting the forward ends of the side stringers together and faying onto the apron or, in metal vessels, a triangular plate

	bracket joining the port and starboard side structural members at the stem. Also called a fore hook. See <i>Crutch Hook</i> .
<i>Breast Rail</i>	The guard rail across the forward end of the poop deck or the after end of the fo'c'sle deck.
<i>Breezeway</i>	An American term for the <i>Side Deck</i> . See under <i>Deck</i> .
<i>Bridge</i>	The location from which a commercial vessel is steered and its speed controlled and also, more appropriately, called the Control Station.
<i>Bridge Deck</i>	The transverse partition between the cockpit and the cabin on a small yacht, the joining structure between the hulls of a catamaran or the superstructure deck on which the Bridge is situated.
<i>Brightwork</i>	Varnished woodwork and/or polished or painted metal, usually on deck.
<i>Brow</i>	A temporary wooden bridge from the ship's side to the dockside to allow personnel to board the vessel. Also called a <i>Passerelle</i> . See <i>Gangway</i> .
<i>BSS</i>	The Boat Safety Scheme: A scheme run by the Environment Agency and British Waterways designed to ensure that all boats comply with published minimum safety standards with which all boats must comply with if required by the relevant navigation authority <i>e.g.</i> British Waterways, The Avon Trust <i>etc.</i> The scheme requires boats to be inspected every four years. A boat cannot be granted a licence unless it has a Boat Safety Certificate (BSC) or, in the case of a new boat, has been certified as complying with the CE standards. Even if the latter she still has to have a Boat Safety Certificate.
<i>Budget Plate</i>	A stiffened flat plate fitted on the centreline under the after swim of a London River lighter or barge designed to help her directional stability when drifting.
<i>Buffalo Rail</i>	An American term. A short decorative bulwark on the fore deck of motor boats and extending from the stem each side. Also called a fashion piece in the U.K. and a monkey rail in America.
<i>Built Chine</i>	A chine stringer or log built of two pieces bolted together. See <i>Chine Stringer</i> .
<i>Built Frame</i>	See <i>Frame</i> .
<i>Bulb Keel</i>	A fin keel with an extra torpedo or cylindrically shaped solid bulb on its lower edge acting as ballast.
<i>Bulbous Bow</i>	A bow fitted with a bulb at below the waterline and extending forward past the forward perpendicular forming a convex entry at the keel/stem junction (as opposed to a sharp vee) incorporated to reduce wave making resistance. When used in conjunction with a reverse curve at the chine, it usually makes sheet materials impractical requiring other planking methods in the forward section of the hull. When extended beyond the extreme forward end of the vessel it is usually called a ram bow.

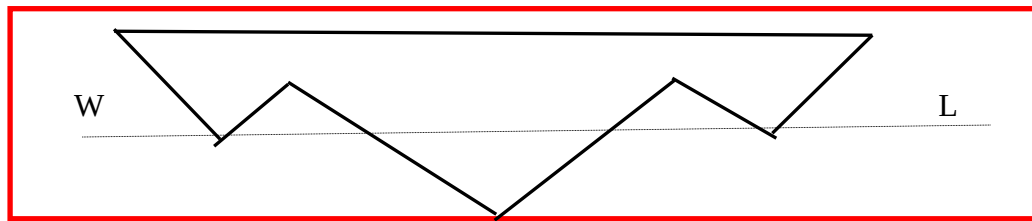
<i>Bulkhead</i>	A secondary main structural item forming a transverse or longitudinal vertical flat surface which subdivides the vessel's interior into separate compartments. Transverse bulkheads are square to the vessel's centreline and are usually, but not necessarily, watertight. They sit atop the hog and are said to be of full height if they finish at the deckhead. Watertight bulkheads, which are required by law on some vessels, should, where necessary, be fitted with watertight doors. The foremost transverse bulkhead which forms the after end of the chain locker or fore peak should lie within 5% of the vessel's length from the after side of the stem and is called the collision bulkhead. Longitudinal bulkheads may be oiltight or watertight in some cases but are usually only light screens except in tankers. Bulkheads are usually stiffened by heavy timbers or angles. The vertical ones are called stiffeners and the horizontal ones sleepers. The foremost bulkhead is sometimes called the <i>Fore Peak Bulkhead</i> or the <i>Collision Bulkhead</i> and the aftermost one the <i>After Peak Bulkhead</i> .
<i>Bulkhead Deck</i>	The uppermost continuous deck to which the watertight transverse bulkheads and the vessel's shell are carried.
<i>Bulkhead Structure</i>	The transverse or longitudinal bulkhead plating together with the associated stiffeners, sleepers and girders.
<i>Bulwark</i>	A vertical protective structure at the upper edges of the vessel's side surrounding the exposed deck formed by an extension of the side planking or plating above the deck to form a rail.
<i>Bulwark Stay</i>	A vertical piece of metal inside a metal bulwark to stiffen the latter and which performs the same function as the timberhead in a wooden boat.
<i>Bumpkin</i>	A spar attached to the stern of a sailing yacht to take the sheet of an overhanging boom.
<i>Bunk</i>	A permanent built in sleeping berth as opposed to as hammock or pipe cot.
<i>Burr</i>	The American name for a Rove (q.v.).
<i>Bustle</i>	An underwater bilge in the after end of a racing sailing yacht's hull alleged to reduce wave making resistance.
<i>Butt</i>	A vertical joint in a strake of wood or shell plating.
<i>Butt Block</i>	A short, longitudinal piece of wood fitted between the timbers to back up the ends of a pair of abutting skin planks.
<i>Butt Strap</i>	An internal small piece of metal used to join two plates in a strake together so that the external surface remains flush and smooth.
<i>Buttock</i>	The convex curved area of a vessel under her stern below her load waterline which overhangs or lies abreast of the sternpost under the <i>Counter</i> (q.v.), the area of the hull where the parallel mid body curves into the run.

<i>Buttock Lines</i>	Used for developing and checking the fairness of the after end lines of a boat. Used only for lofting the lines to full size. See <i>Bow Lines</i> .
<i>Cabin</i>	A room or space within the vessel for human habitation, the below deck living quarters for passengers or crew.
<i>Cabin Height</i>	The cabin height (H_C) is measured from the top of the cabin sole to the underside of the deck supporting structure on the vessel's centreline.
<i>Cabin Sole</i>	The lower deck inside the accommodation cabin of a yacht covering the bilge space. See <i>Hull Liner</i> .
<i>Camber</i>	The transverse upward curve of the upper deck designed to enable the vessel to shed water overside easily. Also (rarely) called the belly of the deck. In America called the crown of the deck.
<i>Canard</i>	An unballasted foil usually mounted ell forward in a racing boat's hull to resist leeway. May be fixed or lifting and a boat may have more than one.
<i>Canoe</i>	A primitive small boat familiar as the birch bark boats of the Red Indians of America and the kayaks of the Eskimos both Inuit and Yupik.
<i>Cant Frames</i>	Primary main structural timbers or frames at the forward and after ends of the vessel laying normal to the skin planking or shell plating and not square to her fore and aft centreline.
<i>Cant Timbers</i>	The knightheads, hawse timbers and bollard timbers together with all timbers forward of the square body are collectively known as cant timbers. Similar (quarter cant) timbers are fitted aft.
<i>Canting Keel</i>	A ballasted keel which can be mechanically canted to windward to increase a boat's righting moment.
<i>Capping</i>	The longitudinal piece of timber fitted over the heads of the frames or timbers of a small boat to form the top of the bulwark. Often, incorrectly, called the gunwale. In America the name is also used for the covering board. See <i>Planksheer</i> .
<i>Cap Rail</i>	A shaped piece of timber or an (usually unequal) angle forming the top of a metal bulwark. Sometimes called the main rail.
<i>Capsize, to (Verb)</i>	To turn over. May be applied to a piece of timber being worked or a vessel in a seaway.
<i>Capstan</i>	A vertical drum like rotating machine electrically or hand operated used for winding in rope or the anchor cable.
<i>Carcase</i>	The (usually softwood) frame of a <i>Studwork</i> (q.v.) deckhouse.
<i>Careen, to (Verb)</i>	To lay a vessel ashore and heel her over by attaching tackles to her mast heads to gain access to her bottom for cleaning or repairs.
<i>Cargo Space(s)</i>	Sometimes (incorrectly) called the cargo area(s) or cargo length area(s). That part of a ship that contains the cargo holds or, in a tanker, the

cargo/slop tanks and adjacent spaces including the ballast tanks, fuel tanks, cofferdams and void spaces and also including the deck areas throughout the entire length and breadth of that part of the ship over the mentioned spaces.

<i>Cargo Hold Bulkhead</i>	A transverse or longitudinal boundary bulkhead separating the cargo hold(s). Usually watertight.
<i>Carling (Carlin)</i>	A primary supporting longitudinal member usually forming the part to which the hatch side or coachroof (accommodation trunk) under the deck supporting the inboard end of the side deck beams. See <i>Coaming</i> . Coamings are fitted and are attached to the inner end of the carling or half beams. In a metal vessel the name is also applied to the lower edge of a hatch coaming where it extends below the deck or to fore and aft flat plate supports between transverse deck beams and designed to prevent distortion of the plating. Also an old shipwright's name for timber over five inches square.
<i>Carling Beams</i>	Also Carlines. Short primary main structural transverse members fitted between the beam shelf and the carling to support the narrow decks alongside the coachroof (or accommodation trunk). They are sometimes called half beams or short beams.
<i>Carvel Build</i>	A method of planking or plating a vessel's hull such that the planks or plates lie edge to edge and do not overlap along the seams or butts fastened to the frames to form a smooth exterior, with a flexible caulking between the planks. See <i>French Carvel</i> and <i>Hemmed Carvel</i> . Usually both palings and wrappers are of the same thickness but, in some arrangements, the wrappers are twice the thickness of the palings.
<i>Casing</i>	A covering or bulkhead around or about any space and built for protection. See <i>Fiddley Casing</i> .
<i>Cat</i>	A collection of timber baulks temporarily held together with spikes and lashings to form a painting raft. Also a short name for a Catamaran (q.v.).
<i>Catamaran</i>	A twin-hulled boat, with hulls side by side.
<i>Catbeam</i>	The broadest beam in the ship generally made in two breadths, tabled and bolted together. The foreside is placed far enough forward to receive the heads of the stanchions of the beakhead bulkhead.
<i>Cathead</i>	A timber extending over the vessel's fo'c'sle side at an angle of about 45° and fitted with a set of sheaves in the outer or stock end and used to raise the anchor out of the water and secure it by means of the cat stopper. These items are usually only found on traditional sailing vessels and, in common practice, the projecting end of the beam was carved to resemble the face of a lion or cat. The name dates back to at least the 17 th Century.
<i>Cathead Knee</i>	A heavy piece of compass timber supporting the cathead and usually faired into the upper harpin or headrail.

Cathedral Hull A racing hull in the form of a triple V.



A Cathedral Hull

Cat's Tail The inner part of the cathead that lays down upon the *Catbeam* (q.v.) in large ships and under the forecastle beams of smaller ships.

Caulk, to (Verb) To make watertight by driving or caulking (usually loose cotton fibres) into a seam, followed by a coarser fibre material such as oakum then stopping with pitch or putty.

Caulking (Calking) Boat cotton, oakum or other fibres driven into planking seams to make them watertight.

Cavetta Stripe A decorative stripe formed by cutting a shallow, narrow longitudinal hollow in the timber of the sheer strake or landing strake. Also called a cove line, cove stripe or cavetto. The plank into which it is carved is called the cavetta or cove strake.

Cavitation Plate A curved plate built out above the propeller on a Dutch barge to reduce the incidence of air drawing and cavitation.

Ceiling Light wooden sheathing or inner skin planking fitted to various parts of the vessel such as the floors and the tank tops to form a working surface and to protect the vessel's structure and the cargo from damage and to prevent cargo falling into the bilge spaces under. Sometimes called footwaling (futlings) in barges. Similar work up the vessel's sides and bulkheads is called lining.

Ceiling Concentrations Chemical concentrations which are not to be exceeded during any given work or even brief period. For a few chemicals such as styrene the ceiling may be exceeded up to a peak value but the duration of such excursions to these peak values are strictly limited and a person's daily exposure must still lie within the PEL range. See PEL.

CE Mark or Plate All boats built after 16th June, 1998 must be certified by the builder as complying with the CE standards. Boats built to these standards do not require a Boat Safety Certificate for the first four years. The only new boats which need not be CE marked are those built on a d.i.y. basis but such boats, if used on the inland waterways, still require a Boat Safety Certificate (BSC) and may not be sold for five years from the date of completion without being brought up to CE standards.

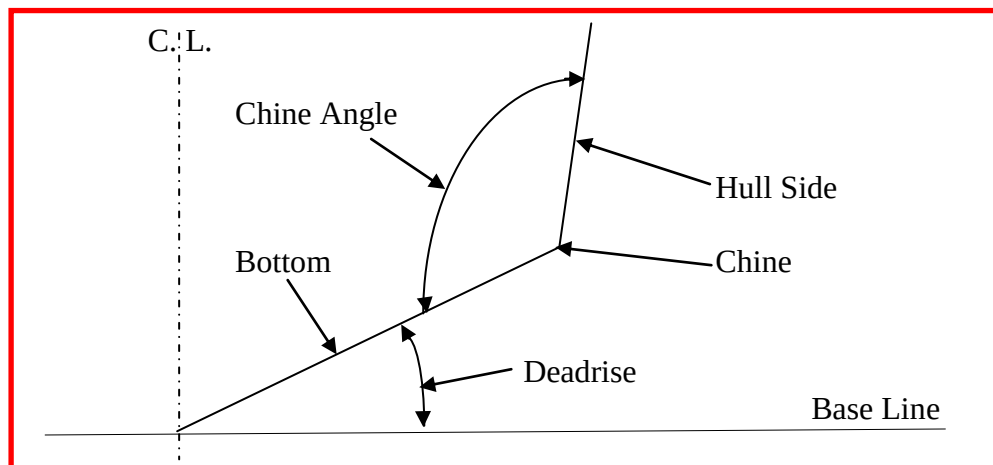
Centre Board A retractable board or plate hinged at the forward end in internal structure called the centre board box and lowered through a slot in the centreline of the hull by means of a wire attached to its free end to reduce the tendency of a sailing vessel to drift to leeward when sailing

on the wind. A variant is the dagger board which performs the same function but is simply pushed up and down by hand.

<i>Centreboard Lift</i>	A line or cable for raising and lowering the centreboard.
<i>Centreboard Pin</i>	A bolt or rod that secures the centreboard to the centreboard trunk and which allows the centreboard to pivot up and down.
<i>Centreboard Box</i>	The casing in boat that houses the centreboard. Called the Centreboard Trunk in America.
<i>Centre Girder</i>	A primary structural vertical plate fitted on the centreline immediately above the keel plate in a metal vessel. Also called a centreline keelson.
<i>Chaffcutter</i>	A barge's steering wheel of cast iron, which in appearance resembles the style of cast iron wheels, used on agricultural implements which included a chaffcutter - hence the name.
<i>Chain Locker</i>	A compartment forward in the vessel's bows dedicated to carry the anchor chain or cable.
<i>Chain Wales</i>	Heavy timbers fastened to the outside of the sheer strake to increase the spread of the shroud anchorages. Usually called <i>Channels</i> (q.v.).
<i>Chain Plate</i>	A metal strap fastened through the sides of the hull, either from inside or outside, with an eye at one end for the attachment of a deadeye or other rigging. Sometimes called a shroud plate.
<i>Chainplate Cover</i>	A plate used to cap the area of the deck where the top of the chainplate protrudes.
<i>Chamfers</i>	Carved decorative fluting on the deckhouse sides and bulwarks.
<i>Channels</i>	A corruption of the name <i>Chain Wales</i> (q.v.) and named after the mast the particular set of attached shrouds it is supporting.
<i>Charlie Noble</i>	A galley stove exhaust pipe.
<i>Chartroom</i>	A space usually in a deck house dedicated the vessel's navigation.
<i>Chase</i>	See <i>Gerald</i> . Also a score cut lengthwise for a tenon to be fixed in as the tenon at the heels of pillars. Ledges may be <i>chased about</i> into the carlings or the carlings into the beams by cutting the score or chase large enough at one end for it to sweep about into its place.
<i>Cheeks</i>	Tiercary pieces of supporting timber usually fitted either side of the horn timber or similar piece.
<i>Chesapeake Bay Bottom</i>	A hull carvel planed up the sides but transversely planked across the bottom on a longitudinal framing system and usually fastened by galvanized cut nails. Rare now even in America.
<i>Chestrees</i>	Pieces of oak timber, fayed and bolted to the topsides, one on each side, abaft the fore channels with a sheave fitted in the upper part for the convenience of hauling home the main tack. Its true situation is half the length of the main yard before the centre of the mainmast. (Obsolete).

Chine Angle This is the angle at the junction between the two parts of a section, on either side of a chine or the angle between the tangents to these two parts, measured in a transverse plane. Also another name for the *Chine Bar* (q.v.).

Chine Bar In a metal vessel a primary longitudinal structural member forming the joint between the side plating and the bottom plating on a vessel fitted with a hard chine midship section. Often, incorrectly and confusingly, called the chine angle.



Definition of Chine Angle

Chine Batten An American term describing the primary structural timber forming the outer edge of a built chine. In the U.K. it is called the outer chine log or chine stringer.

Chine Line This is the actual (in a hard chine), or imaginary (in a soft chine), locus of the intersections of the two parts of the hull form at the chine. It appears as curvilinear in the profile, body and the half breadths plans. See *Lines Plan*.

Chine Log The primary main structural item forming the corner of a vessel with a hard chine midship section. In a built chine the log is divided longitudinally into an inner and an outer chine log.

Chine Stringer The name in the U.K. for the American term *Chine Batten* (q.v.).

Chinese Galvanizing A shipwright's name for cooling off red hot bolts or drifts in boiled linseed oil and so forming an anti rusting skin over the item's surface. If tar is used instead of linseed oil, the process is called Swedish galvanising.

Chock An American name for the fitting through which anchor or mooring lines are led. Usually U shaped to reduce chafe. See *Fairlead*.

Cill See *Sill*.

CIN Craft identification Number.

<i>Clamp</i>	A secondary supporting longitudinal timber fitted to port and starboard just below the beam shelf and usually running between the forwardmost and the aftermost bulkheads. It can be in one of two forms: - i. The frame clamp sitting just below the beam shelf and on the inside of the frames. ii. The beam clamp sitting inside the beam shelf and below the ends of the beams. The beam clamp is a secondary supporting timber and when not fitted the frame clamp is called simply the clamp. In America the name given to the beam shelf and stringers.
<i>Claw (or Dog)</i>	A cast iron hook for holding a barge's anchor chain temporarily while adjusting the chain on the winch barrel.
<i>Clench</i>	The point at which the inner end of the anchor cable or chain is secured to the hull. The word comes from the Anglo Saxon verb <i>beclencen</i> meaning to grip firmly.
<i>Clench Fastening</i>	Securing a boat nail by placing a rove or roove (washer or, in America, burr) over the inboard end, cutting off the surplus end to the nail and riveting it hard over. In America the process is called riveting. See <i>Turned Nails</i> .
<i>Clinker Build or Construction</i>	Also called clencher or clench build. A method of planking or plating a vessel's hull such that the planks or plates overlap or hem along the seams. Also, in America, called <i>Lapstrake</i> .
<i>Clipper Bow</i>	A bow where the stem has a forward curve and forward sides are heavily of flared. Also, incorrectly, called a schooner bow.
<i>Coachroof</i>	A light superstructure above the deck forming an extension of the deck head height in the accommodation. In America it is called the trunk.
<i>Coak</i>	A block or blocks of hardwood set into the faying surfaces of a scarph to prevent it opening sideways.
<i>Coaming (1)</i>	A secondary main vertical plate or wooden structure forming the boundaries of the main hatch or cockpit and usually protruding above the deck to prevent water from entering the hold or cockpit.
<i>Coaming (2)</i>	The steel (or wood) left or fitted below the lower edge of a door sited on the upper deck and designed to prevent sea water on deck from going below.
<i>Coaming Angle</i>	In a metal boat the angle that connects the outside of the coaming to the inner edge of the side deck.
<i>Coaming Stay</i>	A vertical piece of metal outside a metal coaming to stiffen the latter.
<i>Coaming Stiffener</i>	A horizontal angle along the outside of a metal coaming to stiffen the latter. Often designed to form a top for the coaming stays and fitted with small lengths of angle bar to take the hatch wedges.

<i>Coat (Mast)</i>	The American name for a protective piece, usually painted canvas sleeve, covering the mast wedges where the mast enters the deck to make the area watertight. In Britain called the mast boot.
<i>Cockpit</i>	A space let into the main deck used by the crew as a working space when handling the vessel usually under sail. The open inset area from where the vessel is steered. More commonly, in a boat, this refers to the outside working or seating area below the deck surface. Bowrider boats have a forward cockpit. While on centre console boats the inside area could be called a cockpit the term is more often used to define a more limited deck area from which the boat is handled.
<i>Cofferdam</i>	A <i>Void Space</i> (q.v.) between two bulkheads or decks designed as a safeguard against leakage (usually of oil) from one compartment into another.
<i>Coffin Plate</i>	The plate wrapped round and under the heel of the stern frame of a metal vessel and which forms the after end of the keel strake. Also called a Heel Plate.
<i>Cold Bent</i>	Frames or Timbers which are bent without steaming after shaping but before fitting them to the hull.
<i>Cold Moulded</i>	A method of boat construction using a male mould over which layers of thin wood and/or plywood are laid diagonally and then glued and stapled together. May be sheathed in epoxy or frp. Usually used for the construction of dinghies and light racing yachts.
<i>Cold Short Iron</i>	Wrought iron containing an excess of phosphorus over sulphur in its chemical make up. See <i>Hot Short Iron</i> .
<i>Colin Archer Stern</i>	A wide decked canoe shaped stern built above a sternpost which extends down to the keel and slopes well aft. Now somewhat rare.
<i>Collar</i>	A strong tiercery supporting piece of structural compass timber connecting the forward ends of the beam shelf together and faying onto the apron. It is usually somewhat thicker than the breast hooks and forms the uppermost of those items.
<i>Collision Bulkhead</i>	The foremost main transverse watertight bulkhead.
<i>Companionway</i>	A weathertight entrance leading from a vessel's decks to the spaces below. Also the stairs or ladder on a vessel usually leading down to the cabin.
<i>Composite Construction</i>	A method of building a vessel built with iron or steel frames but planking and decking her in wood.
<i>Confined Space</i>	A space defined by one of the following characteristics: - i. A space with limited openings for entry and exit. ii. A space with unnatural or limited ventilation. iii. A space not designed for continuous worker occupancy.

<i>Connecting Angle</i>	An angle bar without a specific location name which connects one piece of structure to another.
<i>Console</i>	An upright box structure in the bridge designed to carry the steering wheel, instruments and engine controls on a motor boat. Usually fitted to starboard in the wheelhouse.
<i>Conversion</i>	The art and science of lining and moulding timber or plank with the least possible waste.
<i>Coppering</i>	Sheathing the bottom of wooden boats with copper or Muntz metal plates laid over felt or waterproof paper and secured by clout nails.
<i>Corner Sett</i>	A short piece of timber fitted at the corners of deck houses forming the junction between the end and side <i>Margin Strakes</i> (q.v.) in a laid wooden deck.
<i>Corrosion</i>	Electro-chemical decay of a metal which may take many forms. See <i>Erosion</i> with which it must not be confused.
<i>Cotchel</i>	A London River bargeman's term for a part freight.
<i>Counter</i>	That portion of the hull at the stern of the boat, emerging from below the water and extending to the transom. Usually long in older designs and short in more recent vessels. Also called the after overhang. See <i>Stern</i> .
<i>Counter Stern</i>	A form of Stern ending in a Counter. See <i>Stern</i> .
<i>Cove Line/Stripe</i>	See <i>Caveta Stripe</i> .
<i>Covering Board</i>	The outer plank of the decking covering over the tops of the timbers. Usually somewhat wider than the ordinary deck planks and covering over the top of the side timbers. The timber heads protrude through the covering board. Also, in America, called the <i>Wash</i> or <i>Apron Board</i> or the <i>Plank Sheer</i> though that latter term strictly applies only to the outer upper corner of the covering board. Also, in America, sometimes called the <i>Sheer</i> (q.v.), the <i>Margin Strake</i> (q.v.) or <i>Capping</i> (q.v.).
<i>Crab Winch</i>	A small hand powered winch used for raising leeboards, etc.
<i>Crank</i>	A sailing ship which either by its construction or by the stowage of its ballast or cargo, heels too far in the wind or one which through lack of ballast or cargo cannot carry sail without the danger of overturning is said to be crank. Ships built excessively deep in relation to their breadth were notoriously crank. Crank by the ground was a related phrase said of a ship whose floor was so narrow that she could not be put ashore to <i>Careen</i> (q.v.) or <i>Bream</i> (q.v.) without danger of overturning unless supported by legs.
<i>Cratch</i>	The board vertically mounted just abaft the fore deck on a narrowboat. The board is often secured at the top end by a plank that runs aft to the cabin roof. The cratch and plank act as the frames for a cratch cover and covers the forward well deck or cockpit and is usually fixed to the cratch upstand.

<i>Croaky</i>	A shipwright's term applied to plank when it curves or compasses much within a short length.
<i>Crook</i>	A piece of timbers with a natural curve to its grain used to make such items as Breasthooks (<i>q.v.</i>) and the Gripe (<i>q.v.</i>).
<i>Crop</i>	The height of the centre of the transverse hatch end coamings above the level of the top of the hatch side coaming. It forms a straight line camber designed to drain water off the top of the hatch covers.
<i>Cross Bored</i>	Bored with fastening holes on alternate edges of the planks to separate them so as to avoid splitting the timbers or beams. A system usually found on <i>Bilge Stringers</i> (<i>q.v.</i>).
<i>Cross Chocks</i>	See <i>Flitch Timbers</i> .
<i>Cross Deck</i>	The deck area between cargo hatchways.
<i>Cross Ties</i>	Transverse structures found in the larger oil tankers to support the longitudinal bulkheads against hydrostatic and hydrodynamic loads.
<i>Crown of the Deck</i>	An American term for <i>Camber</i> . (<i>q.v.</i>).
<i>Crown of the Tank</i>	A rare name for the flat deck that forms the top of the <i>Forepeak</i> (<i>q.v.</i>) Tank.
<i>Crown Strake</i>	The central strake of plating on a metal deck.
<i>Cruiser</i>	A boat normally of fibre reinforced plastic construction with an enclosed cabin and steered by a wheel rather than a tiller. A power boat with certain minimum appurtenances for living afloat. These are sleeping accommodation, cooking facilities, a head, lounge space, fuel and water tanks. The terms sedan, express and day are loose categories meant to place emphasis on certain qualities of the boat. A sedan cruiser has more glass and more lounging area, express cruiser is faster and a day cruiser has minimal accommodations and usually only practical for limited overnight stays.
<i>Cruiser Stern</i>	A type of stern characterised by a curvilinear profile and plan and U shaped sections and called so because of its common use on the cruisers built for the Royal Navy. See <i>Stern</i> .
<i>Crutch Hook</i>	In wooden vessels a tiercery piece of timber or, in metal vessels, a triangular plate at the after end of the vessel performing the same function as the breast hook at the forward end.
<i>Cuddy</i>	A small shelter cabin on a boat.
<i>Cumblading</i>	A decorative piece of timber fitted round the transom of a sailing barge or other wooden boat and covering the after ends of the planking stopping at the transom. Also called a <i>Fashion Piece</i> . See <i>Badger Strake</i> .

<i>Curtain Plate</i>	A shallow piece of decorative plating fitted to the outer edge of superstructure decks to form an attachment for the ends of the deck beams.
<i>Curve of Areas</i>	A line drawn on the <i>Lines Plan</i> (q.v.) showing the underwater area at each cross-sectional station on the vessel.
<i>Cutch Timber</i>	A horizontal secondary main structural item joining together the after ends of the beam shelves and supporting the after end of the deck planking. The term is also applied to the transverse timber at deck level between the after ends of the covering boards.
<i>Cut up</i>	The amount measured at the <i>Fore Perpendicular</i> (q.v.) by which the forward end of the keel is raised above the <i>Underside of Keel Line</i> (q.v.).
<i>Cutwater</i>	The leading edge of the stem at the waterline. In a built stem it is often an additional secondary main piece of timber running from a hook in the stem proper to the underside of the Lacing Piece. See <i>Stem</i> . Often incorrectly called the <i>Prow</i> (q.v.). On narrowboats called the <i>Feather</i> (q.v.).
<i>Dagger Board</i>	A blade shaped board that is lifted out of a case when raised and dropped vertically through the hull to prevent leeway. May be completely removed for beaching or for sailing downwind. Usually only suitable for small boats. See <i>Centre Board</i> .
<i>Datum Water Line</i>	The water line or water plane at which the vessel is intended to float and is the basic water line used to design the vessel. In a cargo vessel also called the <i>Load Water Line</i> (LWL) and, in such vessels, it passes through the centre of the Plimsoll Mark which marks the legal freeboard summer line. Sometimes called the <i>Designer's Water Line</i> and one of the five fundamental design lines of a vessel. Usually given the designation DWL. See <i>Lines Plan</i> .
<i>Davit</i>	Pronounced <i>dayvit</i> . A small curved crane or derrick on board projecting over the side or that can be swung out over the side of larger boats to lift small loads or fitted in pairs and used to raise or lower small boats and light items from deck to water level.
<i>Deadlight</i>	A hinged solid bronze or steel door fitted to the inside of a clamped over a side light or scuttle to enable the vessel to be blacked out or to protect her in heavy weather. Sometimes called dead covers. A seaman's term for a man's eyelids.
<i>Deadrise</i>	The angle the bottom amidships rises from the horizontal or the amount that the bottom rises from where it joins the keel to the chine or the lower turn of the bilge keel. Most properly applied to V bottom boats but also applied to round bottom vessels. Also called the <i>Rise of Floor</i> . (q.v.) See <i>Chine Angle</i> .
<i>Deadweight</i>	The sum total of the weight carried by the vessel, cargo, stores, water, fuel, crew, passengers etc and the difference between the displacement

weight and the vessel's actual weight of structure, rig and machinery. In some English dialects it is called the *Bearing* laid on the vessel

<i>Deadwood</i>	The tiercery structural member formed from a solid block or conglomeration of solid blocks of timber. The vertical structure built up from the keel to support the cant frames at the stern or stem. The longitudinal timbers of a vessel's structural backbone which lie entirely outside the keel, sternpost, and horn timber rabbet lines. The forward deadwood sits immediately behind the gripe and is bolted to the keel and the lower end of the stem. The apron sits on top of it and the hog butts up to it. The after deadwood sits on top of the keel immediately in front of the stern post both of which are bolted to it. The inner stern post sits on top of it and the hog butts up to it.
<i>Dead Work</i>	Skin planking from the first strake above the bilge wale up to and including the sheer wale.
<i>Decay</i>	The decomposition of the wood substance by fungi. i. Advanced decay is the older stage in which the decomposition is easily recognised because the wood has become soft, spongy, stringy ring shaken, pitted or crumbly. Decided discolouration or bleaching of the rotten wood is often clearly apparent. ii. Incipient decay is the early stage that has not proceeded far enough to soften or otherwise perceptibly impair the hardness of the wood. It is usually accompanied by slight discolouration or bleaching.
<i>Deck</i>	A horizontal working surface within the vessel and is designated by its function. There are a number of different definitions: - i. The <i>Main Deck</i> is a horizontal surface usually forming the upper enclosing part of the vessel's structure. It is sometimes called the upper deck. ii. The <i>Freeboard Deck</i> is that to which the freeboard is measured and is defined by statute. In most vessels the freeboard deck and main deck are one and the same. iii. The <i>Lower Deck</i> is lowest deck in a vessel with two decks and is sometimes, incorrectly, called the 'tween deck. Strictly, the cabin sole in a small yacht is the lower deck. iv. The '<i>Tween Deck</i> is the space below the main deck in which cargo may be carried. This term is sometimes (incorrectly) applied to the lower deck itself. v. The <i>Orlop Deck</i> is the lowest deck in a vessel with three or more decks. vi. The <i>Upper Deck</i> is cambered from port to starboard but the lower deck(s) and orlop deck are usually flat. If small in area they are often simply called flats.

- vii. The *Weather Deck* is the uppermost continuous deck exposed to the weather.
- viii. The *Side Deck* is the upper deck outboard of any structures such as a coachroof or doghouse and is often, in America, called the *Breezeway*.
- ix. The *Cross Deck* is the transverse deck between two hatchways.
- x. A *Bright Deck* is one laid with teak or alternate planks of cedar and mahogany, caulked and payed and planed smooth and coated with oil or varnish.

<i>Deck at Side Line</i>	(D@SL) A line drawn through the points where, in transverse section, the moulded surface of the deck contacts the moulded surface of the hull. In profile the line is co-incident with the sheer line. One of the five <i>Fundamental Lines</i> (q.v.) of a vessel's design. See <i>Lines Plan</i> .
<i>Deck Beam</i>	See <i>Beam</i> (2).
<i>Deckhead</i>	The underside of any deck or flat.
<i>Deck House</i>	A weathertight superstructure above the freeboard or weather deck not extending from side to side of the vessel.
<i>Decking</i>	The primary main structural planking forming the deck surface. It may be laid straight fore and aft and <i>Joggled</i> (q.v.) or <i>Sniped</i> (q.v.) to the <i>Covering Board</i> (q.v.) or sprung (swept) to the same curve as the covering boards and joggled to the king plank or laid herringbone fashion. When the main deck is constructed of metal, plywood or frp it is often fitted with a fairly thin decorative layer of deck planking similarly laid as a structural deck. Such a layer is called <i>Sheathing</i> .
<i>Deck Light</i>	A fixed light set into the deck or cabin top to provide daylight below.
<i>Deck Plate</i>	A plate forming part of the structure of a metal vessel's deck or a small fitting set flush with the deck, forming the upper extremity of a piping system.
<i>Deck Runner</i>	A secondary supporting piece of longitudinal supporting angle fitted under the deck beams in the larger vessels and bracketed to the deck and beams in way. Often, in turn, supported by <i>Pillars</i> (q.v.).
<i>Deck Saloon</i>	A raised Coachroof (q.v.) with large windows enabling people inside to see out while remaining seated.
<i>Deck Structure</i>	The deck planking or plating together with the beams, stiffeners, girders, runners and supporting pillars.
<i>Declivity</i>	The angle of slope measured either in degrees or, more commonly, as so much drop per unit length of a slipway or marine railway.
<i>Deep Frame</i>	See <i>Web Frame</i> .

<i>Deep Tank</i>	A tank extending from the vessel's bottom or inner bottom up to or higher than the lowest deck.
<i>Deep Vee Hull</i>	A hard chine power boat having a 15 degree or more angle deadrise at the transom.
<i>Depth</i>	The vertical dimension of the vessel's hull at her mid length between perpendiculars. Two depths should be measured and recorded. - The <i>Depth Moulded</i> (D_M) is the depth at side at mid perpendicular length from the top of the keel (or in a wooden vessel from the keel rabbet) to the underside of the deck plate (or, in a wooden vessel, to the top of the deck beam at side). to the underside of any canoe body or to the top of the keel. - The <i>Depth Extreme</i> (D_E) is the depth at side at mid perpendicular length from the underside of the keel to the top of the deck or the top of the sheer strake whichever is the greater.
<i>Derrick</i>	A boom attached by a gooseneck hinge to the heel of a mast or derrick post and rigged with guys, topping lift and runners to act as a crane for the lifting of cargo.
<i>Derrick Post</i>	A short mast often at the side of a vessel designed to carry a derrick. Also called a <i>Sampson Post</i> .
<i>Designer's Water Line</i>	See <i>Datum Water Line</i> .
<i>Diagonal Lines</i>	Fairing lines showing as straight lines in the body plan and as curved lines on the sheer draught (or profile) and the half breadth plans, Sometimes called Ribband lines.
<i>Diagonal Planking</i>	Planking (usually of double thickness) laid at an angle to the fore and aft line of the keel. See also <i>Double Diagonal Build</i> and <i>Ashcroft Construction</i> .
<i>Diagonal Plates</i>	Narrow strips of plate run diagonally across the deck and attached to the beams when the deck is not fully plated but closed off with caulked wooden planking as in composite construction.
<i>Diagonal Rider Timbers</i>	Strengthening timbers laid diagonally inside the inner moulded surface of the <i>Cant Frame</i> (q.v.) running from under the <i>Shelf</i> (q.v.) one side across the keel to the underside of the <i>Shelf</i> on the opposite side. In America called Pointers.
<i>Dimensions</i>	These are divided into the vessel's dimensions and those of her compartments or items of structure. See <i>Scantlings</i>. - The <i>Principal Dimensions</i> comprise the <i>Length</i>, (q.v.), the <i>Beam</i> (1), (q.v.), the <i>Depth</i>, (q.v) and the <i>Draught</i>. (q.v.). - The <i>General Dimensions</i> comprise the overall dimensions of the various part, spaces or compartments within the vessel and

those of the various items of her structure and may be classed as secondary, tertiary *etc.*

<i>Diminishing Stuff</i>	The lower side planking above the bilge wale and so called because the thickness of the planking diminished from that of the <i>Thick Stuff</i> (<i>q.v.</i>) below the bilge wale to that of the topside planking. (Obsolete).
<i>Dinghy</i>	A small open boat often used as a tender for a larger craft. Also a small sailing boat fitted with a Centreboard (<i>q.v.</i>) of about 14 to 16 feet in length. Small, fast runabouts are not dinghies..
<i>Discharges</i>	Any pipe leading overboard through the vessel's side for the conveyance of bilge or circulating water, drains <i>etc.</i> Also called overboard discharges. See <i>Skin Fittings</i> .
<i>Displacement</i>	The weight of water displaced by a floating vessel at rest in still water, thus, the measured mass (weight) of the vessel and everything in her. Not to be confused with measurement tonnages.
<i>Displacement Hull</i>	A type of hull supported by buoyancy alone displacing a weight of water equal to its own weight, that ploughs through the water and that will not exceed a fixed speed even when more power is added. See <i>Planing Hull</i> and <i>Hull Form</i> .
<i>Displacement Stations</i>	See <i>Section Lines</i> .
<i>Dodger</i>	A temporary canvas screen (sometimes with vinyl windows) fitted over a cockpit or similar to keep out the weather.
<i>Dog (1)</i>	A metal fitting used to secure watertight doors, hatch covers and scuttles. See <i>Claw</i> .
<i>Dog (2)</i>	An iron implement used by shipwrights having a fang at one or sometimes at each end to be driven into any piece for supporting it while hewing. Another sort has a fang in one end and an eye at the other in which a rope may be fastened and used to haul anything along.
<i>Doghhouse</i>	A light structure above the deck and (usually) abaft the coachroof forming a shelter for the helmsman and navigator.
<i>Dogleg</i>	Instead of having a radius cambered deck, some of the cheaper modern vessels have a flat, horizontal central portion with the sides of the deck flat but angled down to the deck at side line. The resultant longitudinal creases (one each side) are called doglegs.
<i>Dolly Winch</i>	Small winch fitted over the anchor windlass used for handling a long, light line in warping.
<i>Dorado Box</i>	A box fitted to the heel of a deck mounted cowl ventilator designed to prevent water going below deck and named after the British yacht to which they were first fitted which was named after the dorado fish.. In America often called a dorade box.

<i>Dory</i>	The American traditional dory is a small, flat bottomed fishing boat with high flaring sides and considerable sheer. The term dory appears to have come from a Red Indian term for a dugout. Over the years the dory has evolved to encompass various types of boats, usually characterized by flat bottoms and flaring sides.
<i>Double Bottom</i>	A tank fitted in the bottom of the vessel between the collision bulkhead and the forward engine room bulkhead and used to carry ballast water or fuel oil. Also called the Inner Bottom. See <i>Tank Top</i> .
<i>Double Bottom Structure</i>	The tank formed by the shell plating and tank top and comprising the shell and inner bottom plating together with the floors, girders and other items below the tank top.
<i>Double Chine</i>	Having two planking junctions or chines between the keel and the deck, giving the hull a more rounded look.
<i>Double Diagonal Build</i>	A method of planking a wooden boat with two skins each laid at 45° and in opposite directions to the keel line and is used when compound shapes are incorporated into the hull. Both skins are of equal thickness. It uses planks of solid wood laid over the hull in layers of opposite diagonals, fastened together with nails or glued with epoxy. The inner skin called <i>Palings</i> (q.v.) are laid with the top of the plank leading aft with the outer skin called <i>Wrapper Boards</i> (q.v.) laid with the top of the plank leading forward. A sheet of oiled calico is laid between the skins to maintain watertightness. See <i>Ashcroft Build</i> .
<i>Doubling</i>	The planking of a ships' bottoms twice. It is sometimes done to new ships when the original planking is thought to be too thin and, in repairs, it strengthens the ship without driving out the former fastenings.
<i>Doubling Plate</i>	A plate welded onto a vessel's shell, deck or bulkhead as a temporary repair.
<i>Dousing Chock</i>	Also spelt <i>Dowsing Chock</i> . A strong tiercery supporting piece of compass timber fayed across the apron and lapped in the knightheads or inside bulwark planking above the upper deck connecting the forward ends of the bulwark main handrail or capping together. Also called a Hawse Hook.
<i>Dovetail Plates</i>	Metal plates formed like a double dovetails and sometimes used to tie the heel of the sternpost and keel together.
<i>Downflooding</i>	Downflooding is the flooding of a vessel's hull or compartment resulting from water on deck. In transverse stability calculations, downflooding points are evaluated to meet regulatory criteria, typically presented in a downflooding angle curve or as downflooding heights.

i. *Downflooding Angle*

The downflooding angle is the minimum angle (the lesser to port or to starboard) at which a downflood point meets the waterline for a given condition of load, displacement or draught. It is that angle of heel at which progressive down flooding of the vessel will occur due to the immersion of an opening.

ii. *Downflooding Angle Curves*

The downflooding angle curve is a graph of downflooding angles against displacement. Multiple curves may be included for various angles of trim, for individual downflooding points or for required downflooding conditions. The curves are often found in stability books.

iii. *Downflooding Points*

Downflooding points, critical points or key points are used in stability evaluation to delineate *extrema* at which the vessel is considered foundered. Depending on the conditions being applied, the downflooding points can be required at any openings such as ventilation openings or exhaust casings, to the edge of coamings for watertight compartments such as the hold coamings, scuttles or emergency exits or to watertight fittings which may be opened at sea such as ports, deadlights and watertight doors.

iv. *Downflooding Height*

The downflooding height is the height above baseline of the lowest downflooding point for a given condition of trim and heel and may, alternatively, be given as the height above the waterline to the downflooding point.

v. *Downflooding Design Considerations*

For the safest operation of a vessel, it is ideal to have no downflooding points, though this is generally not practical apart from submarines. Where possible, downflooding points should be eliminated or minimized in size. Where downflooding points are unavoidable, they should be placed as far from the vessel's extremities as possible. Hatches should be on suitably sized coamings and ventilation or feed air openings should be as high as practical above the waterline. These steps all seek to increase the angle of trim/heel at which they would be immersed. Care should be taken to ensure that fixtures, such as watertight doors or manhole covers, are adequately tested for leaks, strength and that they have adequate structural support.

Drag The downward slope of the keel from forward to aft. Also occasionally used to mean the resistance to a vessel's progress.

Draught In America called the draft. The depth of the lowest part of the hull below the datum water line. The forward draught is where the

underside of keel line crosses the forward perpendicular and the after draught where it crosses the after perpendicular. The mean draught is the average of these two. The mean moulded draught is the average of the two draughts measured as above but using the moulded base line or, in the case of a wooden boat, the rabbet line instead of the underside of keel line. Usually designated T from the German *Tiefgang*.

<i>Drift (1)</i>	Those parts where the sheer is raised according to the heights of the decks or gangways and where the rails are cut off and ended by scrolls. (Obsolete). Usually, these days, called the break of the fo'c'sle or poop as appropriate.
<i>Drift (2)</i>	The hole bored for the reception of a <i>Treenail</i> (q.v.) or a <i>Drift Bolt</i> (q.v.).
<i>Drift Bolt</i>	A long fastening driven (pin) or threaded (bolt) to receive end nuts and used for joining heavy timbers such as horn timbers and stern frames, also used to fasten and reinforce wooden panels on edge, such as rudders and centreboard trunks. The hole into which a drift pin or bolt or treenail is driven is called the drift.
<i>Dry Rot</i>	A fungal decay causing seasoned timber to become brittle and crumble to powder. Dry rot needs extended periods of moisture (fresh water), oxygen and dry rot spores to thrive.
<i>Duct Keel</i>	A keel structure built of plates in box form extending the length of the cargo spaces and used to house ballast and other pipe lines leading through the holds. Also called a pipe tunnel.
<i>Dutch Keel</i>	An extension or alteration to take the after end (heel) of the keel of a Dutch barge below the normal Underside of Keel (USK) line drawn along the bottom of the rest of the keel to enable a larger propeller to be fitted.
<i>Dutchman</i>	A wooden block or wedge used to fill the void in a badly made joint or a small diagonally shaped graving piece used to repair a small damage in the decking or planking. See <i>Bible Block</i>
<i>Edging</i>	The amount of wood required to be cut away from the edge of a board when fitting strakes. Also the act of trimming away such waste wood.
<i>Edge Nailed</i>	The method of fastening strip planks to each other.
<i>Edge Set</i>	Bending a plank or long piece of timber across its width by steaming or main force to obtain hang or sny.
<i>Eight Square</i>	A length of timber sawn or dubbed to an octagonal cross section is said to be eight square.
<i>Ekeing (Eking)</i>	A secondary supporting piece of structural timber extending the arms of the collar each side aft to the first bulkhead.
<i>Electrolysis</i>	An electro-chemical attack on ferrous metals in the presence of an electrolyte – usually sea water – requiring the active participation of an

	externally applied electro motive force. Not to be confused with <i>Galvanism</i> . (q.v.) and it is not another name for pitting.
<i>Elephant's Trunk</i>	A short length of flexible hose attached to the transom scupper of a RIB and designed to free the deck of water.
<i>Elliptical Stern</i>	A form of stern which, in plan, has the shape of a half ellipse. Usually taken as a synonym for a <i>Counter Stern</i> (q.v.) although the two are different.
<i>Enclosed Space</i>	The superstructure with bulkheads forward and/or aft fitted with weathertight doors and closing appliances.
<i>Enclosed Superstructure</i>	A superstructure fitted with bulkheads forward and aft fitted with weather tight doors and closing appliances.
<i>Engine Earthing Point</i>	A common terminal point on the engine block to which the negative battery terminal, the negative bus bar and the bonding system are connected.
<i>Engine Casing</i>	See <i>Fiddley Casing</i> .
<i>Engine Girder</i>	The secondary main structure fitted in the engine room to support and hold the main engine.
<i>Engine Room</i>	Also called the machinery or motor space or room. A space dedicated to the accommodation of the power and generator units.
<i>Entrance</i>	The length of the vessel's body under water lying forward of the forward end of the parallel mid body i.e. the distance from the <i>Fore Perpendicular</i> (q.v.) to the start of the <i>Parallel Mid Body</i> (q.v.).
<i>Epoxy Resin</i>	A resin that, though more expensive than polyester resin, is stronger, makes a very good glue and a good filler for small holes and cracks in an frp structure.
<i>Equipment Number</i>	A number determined by the vessel's principal dimensions which the classification societies use to determine the number and sizes of anchors and cables for new vessels.
<i>Erosion</i>	Deterioration of a wood, metal or plastic surface by mechanical wear and tear. See <i>Corrosion</i> with which it must not be confused.
<i>Escutcheon</i>	The central compartment of a transom whose area is divided up by external timbers.
<i>Escutcheon Plate</i>	A wooden board attached to the transom sometimes in two pieces, into which the name and port of registry of the vessel is carved.
<i>Even Keel</i>	A ship is said to swim on an even keel when she draws the same quantity of water aft as forward.
<i>Expanded Polystyrene</i>	Lightweight material used to provide buoyancy or insulation.

<i>Eyes</i>	Colloquially the hawse holes in the ship's bow plating are often called her eyes. In the Mediterranean, many small boats have an eye painted on each bow so that the boat can see where she is going. A very ancient superstition.
<i>Facing</i>	Fitting a piece of timber onto another for strength or finishing purposes or the piece of timber itself.
<i>Fair</i>	A term used to denote the evenness or regularity of a curve or line.
<i>Fair, to (Verb)</i>	To smooth or fair up a vessel's lines plan to eliminate irregularities.
<i>Fairing (1)</i>	Additions to the structure covering a part of the vessel extending into the water flow to reduce head resistance.
<i>Fairing (2)</i>	The geometrical process during lofting of adjusting the lines full size so that the moulded hull surface is fair with no dips or bumps in the longitudinal and frame lines, first on the drawing board or computer and then, full size, in the <i>Mould Loft (q.v.)</i> . See <i>Scrive Board</i> . Also the process of bevelling the stem, chines, longitudinals, keel and frames so that the planking will have flat surfaces to which it can be fastened.
<i>Fairlead</i>	A cast metal deck fitting oval or U shaped or hole in a solid bulwark to in order to change the direction of the lines or to give a fair run to a mooring or running rigging line. May be of the open top or the Panama type. They help reduce friction and abrasion saving the lines from excessive wear and tear.
<i>Fairmile Bottom</i>	Method of planking on hard chine boats with carvel sides and a double diagonally planked bottom. Only usually found on wartime M.T.B.s.
<i>Fallout of Side</i>	The angle of flare of the flat side plate amidships of a London River lighter or barge.
<i>False Keel</i>	A sacrificial length of timber, called a batten in America, piece of timber fastened under the keel or a wooden boat to take the wear caused by the vessel bottoming out or being hauled up a beach. Also called a <i>Worm Shoe (q.v.)</i> .
<i>False Post</i>	A piece tabled on to the aft part of the heel of the main part of the stern post. It is to assist the conversion and preserve the main post should the ship tail aground.
<i>Fantail</i>	The American name for the after deck over the counter.
<i>Fashion Boards</i>	Loose boards, which slide in grooves to close a companion, scuttle or cabin entrance. Deep sea men call them Storm Boards.
<i>Fashion Pieces</i>	Vertical pieces of framing timber attached to the stern post and wing transom timbers to form the shape of the stern. See <i>Covering Board</i> , <i>Buffalo Rail</i> , <i>Monkey Rail</i> and <i>Cumblading</i> .
<i>Fat Plank</i>	A fisherman's term for a <i>Wale (q.v.)</i> .

<i>Fay to (Verb)</i>	Used to describe timbers or metal surfaces joining so closely together that there shall be no perceptible space between them. The actual surface is called the Fay or the <i>Faying Surface</i> (q.v.).
<i>Faying Surface</i>	The surfaces of structural items in contact with each other and joined or about to be joined together. Also called the Fay.
<i>Feather</i>	The <i>Cutwater</i> (q.v.) or leading edge of a narrow boat's stem.
<i>Fender</i>	A flexible barrier positioned between the side of the barge and the quay or other vessel for use when going alongside. Often an old car tyre.
<i>Fibreglass</i>	See Glossary 6 - FRP Boat Building Terms above.
<i>Fiddle</i>	A small, light wooden grid temporarily fitted over a table to prevent items sliding about when the vessel is encountering rough weather.
<i>Fiddlehead</i>	The forward extension of the steam head in place of a <i>Figurehead</i> (q.v.) also called the <i>Beakhead</i> (q.v.) or <i>Billethead</i> (q.v.).
<i>Fiddley Casing</i>	The steel superstructure over a tug or coaster's engine room.
<i>Fife Rail</i>	A light structure round the masts consisting of stanchions surmounted by a wooden capping into which belaying pins are fitted to take the running rigging. Also called a Pin Rail.
<i>Figurehead</i>	A carved wooden human or mythological figure fitted at the head of the stem.
<i>Fillet</i>	A fillet is a cove shape made with putty on an inside corner and is made with activated epoxy resin, thickened with various fillers, to a putty consistency. The putty is globbed into place and smoothed with a rounded tool. Also a weld made between two plates at right angles.
<i>Filling Chocks</i>	Pieces of secondary supporting timber used to fill the spaces between more important structural items.
<i>Fin</i>	A structure extending beyond the moulded surface of the hull in the form of a wing. Usually found as a keel when it is called a fin keel.
<i>Fin Keel</i>	A deep narrow keel found on most modern ocean racing yachts that creates less drag than longer more conventional keels.
<i>Fire Retardant</i>	Shipboard materials such as frp, fabrics, paddings and draperies which have a considerably higher degree of flammability than non combustible materials yet maintain a degree of fire resistance than that of non fire retardant materials of similar construction.
<i>Fish Plates</i>	Wood or metal plates used for securing together the ends of a lengthening joint in any form of structural work.
<i>Fixed Keel</i>	Usually associated with a sailing boat, this is simply a non retractable keel. A fixed keel trailerable boat requires a special trailer and special launch facilities.

<i>Flam</i>	The topsides of a vessel with convex U sections at the entrance are said to flam.
<i>Flange Laid</i>	An angle which is placed such that the flange lays to the associated plate is said to be flange laid. Commonly found in riveted vessels.
<i>Flare</i>	The topsides of a vessel with concave V sections at the entrance are said to flare and the amount of flare is the overhang of the deck over the vessel's topsides forward. The outward curve of a vessel's sides near the bow. Also a distress signal.
<i>Flare Angle</i>	The angle of slope of the forward sections measured from the horizontal water plane.
<i>Flat</i>	A secondary small area deck usually fitted to support local machinery items such as the steering gear. Also an inland waterways barge (archaic) or a raft of loose timbers roughly put together to enable work overside to take place.
<i>Flat of Floor</i>	The area of the bottom of a vessel from the side of the keel outward where there is no curvature to the bottom plating or planking. Its extent is usually drawn as a curved longitudinal line on the half breadth plan.
<i>Fleming Gear</i>	This invention was for a hand operated propelling gear for use in ship's lifeboats and was patented on the 23 rd September, 1941 by Ivan Rupert Fleming and Frank Elder Fleming in Liverpool. It consisted of a series of oscillating levers connected to a common coupling bar which drove a longitudinal shaft through cranks thereon and thence to a propeller. Owing to the fact that ship's lifeboats are frequently stowed for considerable periods. it is important that the operating mechanisms should be reliable and simple and the type of gear has the advantage of reliability and simplicity although the gears between the propeller shaft and the transverse shaft and the reversing gear are exposed. A later form of the gear improved the arrangement so as to reduce the risk of corrosion. It is highly unlikely that the modern marine surveyor will come across this gear but he should know of it. Lifeboats so fitted were allowed to carry fewer oars but had to be fitted with extra buoyancy tanks to account for the weight of the gear. Probably obsolete.
<i>Flitch Timber</i>	A separate main structural transverse timber running across the top of the hog to strengthen the bottom of small boats or dinghies. Also called a cross chock.
<i>Floodable Length</i>	This is a subdivision requirements which specifies a number of compartments for which a ship must be able to sustain flooding and remain afloat. The requirements are subject to IMO, classification and flag state regulations. A factor of subdivision is calculated for the ship, describing the number of compartments which would be flooded. A floodable lengths curve is calculated, inclusive of allowable permeabilities, either in order to place subdivision bulkheads or verify their compliance.

<i>Floodability</i>	This is that characteristic of the construction of a ship that defines her ability to resist flooding. It is reduced by dividing the volume of the hull into watertight compartments by means of decks, transverse or longitudinal watertight bulkheads and the use of double bottoms. If a ship's hull is divided into watertight compartments, any flooding resulting from a breach of the hull can be contained within the compartments where the flooding occurs and as long as the flooding is localised, the ship may retain sufficient buoyancy to remain afloat. Floodability is usually described by the number of compartments that need to be open to the sea for the ship to lose sufficient buoyancy to cause her to sink. Most small craft have single compartment floodability which obviously means that, if that compartment is open to the sea and flooded, the vessel will inevitably sink. Ships with two or three compartment floodability will usually sink slowly by the head or the stern and will usually remain upright in the process of sinking. Vessels, such as narrowboats, which have single compartment floodability will usually sink rapidly – known as plunge sinking – and will often turn on their sides or capsize in the process.
<i>Floor or Floor Timber</i>	In a metal vessel a primary supporting structural transverse item running at each frame station from the side of the vertical keelson to the bilge where the heels of the side frames are attached to it. Floors may be of one of two forms: - i. <i>Solid or Plate Floors</i> cut out from a piece of plate and fitted with lightening holes. ii. <i>Bracket Floors</i> which are constructed of channels and/or angles supported at each end by flanged plate brackets. In a wooden vessel the floor timber is the lowest futtock in a built timber or frame that runs transversely across the top of the hog and joins the port and starboard frame bilge futtocks at the centreline.
<i>Floor Angle</i>	An ordinary angle connecting the floors in a metal vessel to the inside of the bottom plating.
<i>Floor Boards</i>	A house builder's term for the cabin sole or <i>Futlings</i> (q.v.). A term not used by marine people.
<i>Floor Futtock</i>	In a wooden boat the lowest of the futtocks from which a built frame is made running transversely across the top of the hog and through which the keel bolts are fitted. The outer ends are often of different lengths and are called the wrung heads or wring heads. See <i>Floor Timber</i> .
<i>Fluke</i>	The arm of an anchor ending in a flat, diamond shaped piece called the palm.
<i>Flush Deck Ship</i>	One that has no superstructure above the freeboard deck.
<i>Flushing Board</i>	A board inserted vertically in the cabin entrance under the sliding hatch.
<i>Flying Bridge</i>	A raised platform above the top of the normal wheelhouse that affords unobstructed vision for steering and navigation.

<i>Foil</i>	An underwater appendage such as a rudder or kee or a horizontal blade designed to hydrodynamically lift a boat's hull out of the water.
<i>Foot Boat</i>	A barge's boat or dinghy.
<i>Foot Walings</i>	<i>Ceiling</i> (q.v.) in wooden barges. Usually corrupted to <i>Futlings</i> .
<i>Fore and Aft</i>	Parallel to the centreline from the stem to the stern.
<i>Fore and Afters</i>	Removable wooden beams running along the centre of the hatch openings beneath the hatch covers, which they support.
<i>Fore and Aft Line</i>	An imaginary line drawn through centre of boat from bow to stern or any line parallel to it.
<i>Fore Body</i>	Also called the Foreship. The hull of the vessel forward of the Midship Section. (q.v.).
<i>Forecastle</i>	Pronounced <i>fo'c'sle</i> . The enclosed superstructure (or forward most space below deck where no superstructures are fitted) at the forward end of the vessel and usually used for stores and the position of the chain locker.
<i>Forecastle Deck</i>	The first deck above the uppermost or main deck at the forward end of the vessel and forming the top of the forecastle.
<i>Forefoot</i>	The area of the vessel near the heel of the stem, in way of the <i>Gripe</i> (q.v.) and the forward end of the keel.
<i>Fore Hook</i>	A <i>Breast Hook</i> (q.v.)
<i>Fore Peak</i>	The space forward of the collision bulkhead often formed as a ballast tank in coasters and such like. Often used in small sailing yachts for anchor or sail stowage. A, usually watertight, compartment in the bow of a boat.
<i>Fore Perpendicular</i>	A vertical line at Station 10 on the <i>Lines Plan</i> (q.v.) either at the forward edge of a vertical straight stem or through the line of the stem where it crosses the load or design water line and is usually designated F.P.
<i>Fore Sheets</i>	These are transverse seats forward of the foremost thwart just behind the stem of a rowing boat or dinghy.
<i>Forward</i>	Toward the bows of the boat.
<i>Form Stability</i>	Stability arising from the shape of the hull rather than its internal weight distribution.
<i>Foot Walings</i>	See <i>Futlings</i> . Also called the <i>Bottom Boards</i> .
<i>Fox Wedges</i>	Wedges fitted into saw kerfs in the end of a tenon or treenail and hidden inside a blind mortise or drift so that when the joint is driven home they expand the end of the tenon to prevent it being pulled apart.
<i>Frp</i>	Fibre reinforced (resin) plastic. See Glossary 6 - FRP Boat Building Terms above.

<i>Frames</i>	Frames are transversely laid primary supporting structural items designed to support and stiffen the skin or shell. Often incorrectly called ribs. On wooden vessels they are called timbers and usually are found as one of three types: - <i>Grown Timbers</i> are hewn to shape out of solid wood and are built from separate pieces called futtocks. They are commonly found in fishing vessels. <i>Sawn Timbers</i> are sawn out of plain sawn wood and are usually found in hard chine motor boats. <i>Steam Bent Timbers</i> are light scantling pieces running from sheer to sheer in one piece and are bent to shape by steaming them till they are flexible. They are commonly found in small yachts and lifeboats. Steel frames are found in both metal and composite built boats and may be of ordinary equal, unequal or unequal bulb section and may be laid flange to the shell in composite and riveted vessels and toe welded or inverted in all welded vessels. See also <i>Cant Frames</i> and <i>Half Frames</i>.
<i>Frame Spacing</i>	The fore and aft distance (f_s) measured from station to station at the midlength of the vessel at the square body frames. Frames, bulkheads and similar items, where numbered, are counted merchant ship fashion starting aft. The distance between bulkhead stiffeners is called the <i>Stiffener Spacing</i> (q.v.).
<i>Freeboard</i>	The height of the main or upper deck above the water line at the mid length of the vessel between perpendiculars. On passenger, commercial cargo and coded vessels it is defined by International law. It is particularly relevant to the expected height of swell or waves and the degree to which the boat might be expected to heel. Measured to the lowest place of possible entry, perhaps to scuppers or to engine compartment ventilation grilles if in hull sides
<i>Freeboard Deck</i>	Normally the uppermost complete deck exposed to the weather and the sea which has permanent means of closing all exposed openings.
<i>Freeing Port</i>	A fairly large opening through a bulwark fitted with protection bars or, alternatively, a self closing lid to allow sea water to run overboard. Also called Wash Ports. Small semi circular holes in a bulwark at deck level are correctly called <i>Scuppers</i> (q.v.).
<i>French Carvel</i>	See half set carvel..
<i>Friesland Bollard</i>	A rounded, inward sloping cast steel bollard with cast in through bolts fitted to the bulwarks of barges built in Friesland.
<i>Fundamental Lines</i>	The five lines that define a vessel's shape. Her <i>Profile and Rabbet Line</i> , <i>Deck at Side Line</i> , <i>Datum (or Load) Water Line</i> , <i>Rising Line</i> and <i>Midship Bend or Section</i> (q.v.). See <i>Lines Plan</i> .
<i>Frenching</i>	Recaulking a leaking rivet. Also called <i>Nobbing</i> and <i>Peening</i> .
<i>Froude Number</i>	A non dimensional measure of a vessel's speed given by: -

(Linear)	F_N	=	$V_S/(gL_{WL})^{1/2}$	-	(1d)
(Volumetric)	F_{NV}	=	$V_S/(gU)^{1/2}$	-	(1b)

where

V_S	=	the vessel's speed	m or ft/s
L_{WL}	=	vessel's water line length	m or ft
g	=	gravitational constant	m or ft/s ²
U	=	cube root of the underwater volume	m or ft

<i>Funnel</i>	The circular or oval steel tube built to take the exhaust from the boiler (if fitted) and/or the main engine out of the ship into the atmosphere. In America it is called the smoke stack and in Scotland the lum.
<i>Furring</i>	Sometimes spelled firring. The act of adding extra timber to the outside of a wooden vessel's frames before replanking in order to increase her beam and transverse stability.
<i>Furring Pieces</i>	Pieces of timber fitted to supply the deficiency of timber the moulding way. Sometimes called Furrens.
<i>Futlings</i>	A verbal corruption. See <i>Bottom Boards</i> and <i>Foot Walings</i> .
<i>Futtock</i>	A solid piece of compass timber several of which make up a built frame extending from the <i>Floor</i> (q.v.) to the <i>Toptimber</i> (q.v.).
<i>Gabling</i>	The (plywood) sides of a <i>Studwork</i> (q.v.) deckhouse. See <i>Carcase</i> .
<i>Gain</i>	See <i>Gerald</i> .
<i>Galley</i>	The vessel's kitchen.
<i>Gallows</i>	A large steel open U frame fitted to the side of a trawler from which the trawling gear is towed. See <i>A Frame</i> .
<i>Galvanism</i>	A naturally occurring phenomenon when two electrically connected metals with different potentials are immersed in an electrolyte – usually seawater. Not to be confused with <i>Electrolysis</i> (q.v.).
<i>Gammon Piece</i>	A horizontal secondary main structural item forming the top of a built stem, the bowsprit is tied down thereto by a rope or chain wound tightly round the pair called the gammoning. See <i>Stemhead Fitting</i> .
<i>Gangway</i>	A raised walkway between superstructures and the area of a ship's side where people board and disembark. A moveable, separate temporary bridge allowing people to walk on board or ashore is called a <i>Brow</i> (q.v.).
<i>Garboard Strake</i>	The skin plank or plate strake lying next to the keel.
<i>Garboard Wale</i>	A garboard strake somewhat thicker than the rest of the bottom planking and sometimes called a beach garboard.

<i>Garvey Hull</i>	An American term for a hard chine hull in which the chines do not join on the stem centreline.
<i>Geometric Lines</i>	A method of drawing ship's hull form lines by the expansion of the conic sections mainly the circle and the ellipse and including copyrighted systems such as Hydroconic and Quadraconic using cones. The term also includes Whole Moulding (<i>q.v.</i>) and produces a lines plan different in form from Mathematical Lines (<i>q.v.</i>).
<i>Gerald</i>	A rabbet cut into the top edge of the forward hood of a clinker planked vessel to enable the hemming plank above it to sit flush. Also called a jerrold, chase or gain.
<i>Gimbals</i>	Pivoted mounts that enable the object they support (a compass, stove, lamp, <i>etc.</i>) to remain level when the vessel heels.
<i>Gingerbread Work</i>	Carved and gilded decorations of the sterns and quarters of wooden sailing vessels. Obsolete slang.
<i>Girder (1)</i>	A secondary main structural longitudinal item in a steel hull. If run below the deck beams it often ties in with the carling and is sometimes called a deck runner. In the bottom of the vessel it is usually fitted in small plates intercostally between the floors when it is usually fitted at the top with a rider angle bar and is correctly called an intercostal side girder but is sometimes called a wing girder. Also a horizontal stiffener to a bulkhead.
<i>Girder (2)</i>	A collective name for primary supporting longitudinal structural members.
<i>Girdling</i>	Adding an additional layer of extra thick planking to the outside of a wooden vessel to increase her beam and improve her transverse stability. Obsolete.
<i>Glue</i>	Various forms of adhesive. The material called marine glue is a special compound for paying caulked seams in the hull or deck consisting of a mixture of rubber, pitch, naphtha and shellac. It has to be melted and applied hot.
<i>Goal Posts</i>	A pair of tall posts fitted one either side of the vessel in way of the cargo hatch and tied across the top and at the heel of each is fitted a derrick.
<i>Gob</i>	May be in the form of a cast steel double cruciform bollard (when it is called a gob bollard) or a cast steel ring (when it is called a gob eye) and is fitted on the after deck of a tug to enable the towing line to be bowsed (gobbed) down and secured to assist the tug's steering.
<i>Going</i>	The horizontal distance between two consecutive risers on a stairway. See <i>Stair</i> .
<i>Goodrich Bearing</i>	A Cutless Bearing.

<i>Gooseneck</i>	A special metal hinge attaching a derrick to the heel of a mast or derrick post and designed such that the derrick may be lifted, lowered or swung from side to side.
<i>Grab Rails</i>	Hand hold fittings mounted on cabin tops and house sides for the safety of personnel when moving around the boat.
<i>Grating</i>	A portable timber grillage with square or rectangular openings designed to allow the free flow of water off the deck.
<i>Grave, to</i>	To inlay a piece of wood so as to make good a small damaged area or to clean a ship's bottom and recoat it in a Graving Dock (Dry Dock).
<i>Graving Piece</i>	The formal name for a <i>Bible Block</i> (q.v.). Its thickness should not exceed one third of the thickness of the timber into which it is inserted.
<i>Gribble</i>	See Biological Attack above.
<i>Gripe</i>	The curved piece of main structural timber forming the vessel's fore foot and is scarphed and bolted at its upper end to the heel of the stem and at its lower end to the forward end of the keel. It is sometimes (rarely) called by the (obsolete) name of horseshoe piece. In America sometimes called the knee of the head (obsolete) or lower stem.
<i>Grounds</i>	Pieces of timber of the same shape as the vessel in way bolted to a metal or ferrocement side shell frame to form a fixing for the lining. See <i>Noggins</i> in Glossary 7.
<i>Ground Tackle</i>	A collective term for the anchors, cables and their associated gear.
<i>Grommet</i>	A fibre ring usually handmade of boat cotton or oakum and fitted round a bolt under the washer and luted with white lead to prevent the bolt leaking. In America it is called <i>Wicking</i> (1) (q.v.).
<i>GRP</i>	Glass Reinforced Plastic. See Glossary 6 - FRP Boat Building Terms above.
<i>Grub Beams</i>	An American term for a built beam of short heavy timbers used to shape a round stern.
<i>Gudgeon</i>	A female casting at the end of the skeg or separately spaced fittings down the rudder post or stern frame to carry the male pintles forming the hinge about which the rudder turns.
<i>Guards</i>	See <i>Rubbing Strake</i> .
<i>Guard Rail</i>	A fence fitted round the deck edge to prevent people falling overboard.
<i>Gunwale</i>	Pronounced <i>gunnel</i> . In a wooden warship, the extra thick piece of skin planking fitted under the lower side of the sills of the gun ports to take the weight of the gun barrel. In a small open boat the top of the boat's side and constructed of the Inwale (q.v.), Capping (q.v.) and Sheer Wale (q.v.). In modern metal vessels it is the upper edge of her sides.

<i>Gusset</i>	A triangular tiercery plate or piece of wood usually fitted to distribute the forces at a strength connection between two structural members.
<i>$\overline{GZ}$ Curve</i>	Also called the Curve of Statical Stability and shows the righting lever at a range of angles of heel.
<i>Hair Bracket</i>	A secondary supporting piece of timber used to support a figurehead or head badge. (Obsolete).
<i>Half Angle of Entrance</i>	The angle subtended by the tangent to the <i>Load Water Line</i> (q.v.) at the stem to the vessel's centreline.
<i>Half Beams</i>	Another name for the <i>Carling Beams</i> . (q.v.).
<i>Half Breadth</i>	A subsidiary drawing on the lines plan showing the curve of the decks and water lines or water planes and upon which the transverse sections and bow and buttock lines appear straight.
<i>Half Deck</i>	The deck over the top of a superstructure that does not extend the full breadth of the vessel.
<i>Half Decker</i>	An open boat with a small amount of decking forward and aft and along the sides.
<i>Half Frames</i>	A collective name for the knightheads, hawse and other cant timbers that do not attach to the keel. Also called Short Timbers or Half Timbers.
<i>Half Set Carvel</i>	A method of double carvel construction where the seams in the <i>Wrapper Boards</i> lie in the centre of the <i>Palings</i> . Also called French Carvel (q.v.).
<i>Hance (1)</i>	The sudden breaking in from one form to another as when a piece is formed one part eight square and the other part cylindrical, the part between the termination of these different forms is called the hance or the parts of any timber where it suddenly becomes narrower or smaller.
<i>Hance (2)</i>	The difference in height of the main rail at the break of the fo'c'sle or poop. Strictly, the curve of the rail so formed. From the Anglo-Norman, from Old French <i>haulce</i> meaning a curve
<i>Hance Plate</i>	The forward or aftermost bulwark plates in way of the <i>Hance (2)</i> (q.v.).
<i>Hard Chine</i>	An abrupt intersection between the hull side and the hull bottom of a boat so constructed. Having a distinct bottom/side planking junction as opposed to a rounded curve.
<i>Harpin</i>	A primary supporting timber or round bar extending over the bow and supporting the stem. Also called a whisker harpin. If fitted at the stern to support the sternpost it was called a trailing harpin.
<i>Hatch</i>	A usually rectangular hole in the main deck or a bulkhead to allow the passage of cargo, stores or of a man <i>etc</i> and fitted with a watertight cover. Sometimes called hatchways. Small square hatches designed only for the passage of a man are often called booby hatches. Similar circular hatches are called scuttles.

<i>Hatch Coaming</i>	The vertical structure built around the hatchways to prevent water from entering the holds and to serve as a supporting framework for the hatch covers.
<i>Hatch Cover</i>	A wooden or steel set of portable pieces fitted over a <i>Hatch</i> (q.v.) designed to prevent the ingress of water into the vessel's holds and, in some vessels, to support deck cargo.
<i>Hatch Landing Angle</i>	An angle or rolled bar fitted at the top of the inside of the coaming to support the outer ends or edges of the hatch covering boards
<i>Hatchways</i>	Generally rectangular openings in the deck affording access to the spaces below. Also called hatches.
<i>Hawse</i>	Part of a vessel's bow in which the <i>Hawseholes</i> (q.v.) are cut.
<i>Hawse, to (Verb)</i>	To drive hard home. Usually used when caulking with a <i>Hawse Iron</i> (q.v.) and beadle. Also spelled Horse.
<i>Hawser</i>	A cable used in warping.
<i>Hawsehole</i>	A hole either side of the stem for a vessel's cable or <i>Hawser</i> (q.v.) to pass through, especially, the anchor cable.
<i>Hawse Hook.</i>	The <i>Dousing Chock</i> (q.v.).
<i>Hawse Pipe</i>	A cast steel tube running through the fo'c'sle to the vessel's side forward through which the anchor chain is rove.
<i>Hawse Timbers</i>	Primary main structural cant timbers at the forward end of the vessel between the knightheads and the bollard timbers. They extend from the forward deadwood to the underside of the covering board. The hawse hole for the cable was fitted through these timbers in the old wooden warships. Sometimes called <i>Hawse Pieces</i> . They are also sometimes fitted with strong pieces round the hawse hole to take the wear from the cable and these form the <i>Hawse Bolster</i> and are also called <i>Naval Hoods</i> .
<i>Head</i>	The forward part of a vessel including the bow and adjacent area or a seaman's name for a lavatory.
<i>Heading</i>	The direction in which the vessel is going.
<i>Headway</i>	The forward motion of the boat through the water or, on a river, the height of the highest part of the underside of a bridge above the normal water level. For example: - Water levels on the Thames are measured above the standard head water level of the lock below. Published figures are therefore very approx. guides only and may well be less than advertised and should be treated with caution.
<i>Head Badge</i>	A carved and ornamental wooden block fitted at the top of the stem in place of a <i>Figurehead</i> (q.v.).
<i>Head Block</i>	See <i>Nose Block</i> .

<i>Head Rail(s)</i>	A complex curved piece of timber fitted either side of the stem structure in a wooden Line of Battle ship and forming the top of the timbers and supporting the <i>Head Badge</i> (q.v.) or <i>Figurehead</i> (q.v.) by means of the <i>Hair Bracket</i> (q.v.). (Obsolete). If more than one they are distinguished as upper, middle and lower. They are usually extended to the stem as <i>Harpins</i> . (q.v.).
<i>Heel (1)</i>	The bottom end of a mast, pillar, bulkhead, frame or any similar structure.
<i>Heel (2)</i>	The inclination of the boat in the water when viewed from ahead or astern or the lowest part of the keel, frame or bulkhead.
<i>Heel Plate</i>	See <i>Coffin Plate</i> .
<i>Helm</i>	The tiller or wheel and surrounding area or the device itself, usually a tiller or wheel attached or connected to the rudder, by which a vessel is steered. Often used by yotties somewhat pretentiously as a verb in place of the traditional steer.
<i>Hemmed Carvel</i>	A method of double carvel planking where the seams in the <i>Wrapper Boards</i> (q.v.) overlap or hem the lower edge of the <i>Palings</i> (q.v.) by 25 mm or so. The overlap is called the <i>Hem</i> . See <i>French Carvel</i> .
<i>HIN</i>	Hull Identification Number now replaced by CIN Craft identification Number.
<i>Hog (Noun)</i>	The primary main structural longitudinal member fitted immediately above the keel and running from the forward to the after deadwood. The inner edges of the garboard strakes are attached to the outer edges of the hog. In the U.S.A. the hog is called the keel batten.
<i>Hog, to (Verb)</i>	A vessel where the ends droop below the midship section is said to hog.
<i>Hold</i>	A compartment below deck in a vessel used solely for the carriage of cargo.
<i>Holiday</i>	An area of skimped work particularly an area that has not been properly glued or painted.
<i>Hollow Run</i>	An area aft where the water lines are concave giving a 'hollow run' to the water flowing aft.
<i>Homlet</i>	The half dovetail joint made connecting the outer ends of the deck beams to the beam shelf.
<i>Homeward Bounder</i>	A deep sea expression for large herringbone stitches used in repairing sails or clothes. Also a slang expression for a heavily inebriated man.
<i>Hood</i>	The length of the ends of the skin planks that lay against the apron or inner stern post. Also called the <i>Hooded Ends</i> (of the planking).
<i>Hook</i>	This is one of two conditions in the bottom of a planing boat where the after buttock lines curve up from the transom while being dished forward of the transom. It can cause performance problems as the hook will

tend to drive the bow down. It can also lead to the bow bobbing up and down.

Hopper Side Tanks Tanks fitted in the sides of bulk carriers and hopper barges and used for ballast and/or buoyancy or stability and are, in large bulk carriers, referred to as topside wing ballast tanks or bottom hopper tanks.

Horn Timber A primary main structural timber extending aft from the top of the stern post onto which the stern of the vessel is built. In Scotland it is called the Outtrigger and, in America, a Strongback.

Horse (Noun) A trestle upon which staging is built or the frame upon which a small boat is built. Also the frame on which staging is erected.

(Verb) To drive hard home when caulking.

Horse Iron A special caulking tool used with a heavy wooden mallet called a beadle.

Horseshoe Piece An obsolete name for the *Gripe* (q.v.).

Hot Frame An American term for a frame which, after being softened by heat, is bent into shape as it is installed. See *Steam Bent Timbers*.

Hot Short Iron Wrought iron containing an excess of sulphur over phosphorus in its chemical make up. See *Cold Short Iron*.

Hounds The wooden mast fittings used to secure the shrouds, forestay and other fittings to the mast. Strictly, only found on gaff and square rigged vessels but on Bermudan rigged boats the area is still called the hounds..

House This is a term applied to a deck superstructure.

House Side The side plating of a deck house.

House Top The top of any deck house.

Hovercraft A vehicle that floats above the water on a cushion of air.

Huff Plate The extra thick plate at the forward and after ends of a swim ended London River lighter or barge to enable her to be used to huff or force another vessel out of her path.

Hull The main body of the vessel.

Hull Form The general shape of the hull which, in small powered craft, is usually, rather vaguely, subdivided into three general types differentiated by their Froude numbers (q.v.).

1. *Displacement hull* where the weight of the vessel is totally supported by the hydrostatic buoyancy force of the displaced water. $F_N \leq 0.24$.
2. *Semi-displacement hull* where the weight is supported partly by hydrostatic buoyancy forces and partly by hydrodynamic planing forces. $0.25 \leq F_N \leq 0.45$.

3. *Planing hull* where the weight is supported entirely by hydrodynamic planing forces. $FN \geq 0.45$.

<i>Hydrofoil</i>	A foil designed to provide lift when moving through water. The name is also somewhat loosely applied to boats fitted with hydrofoils.
<i>Hygroscopic</i>	An adjective referring to a material which absorbs water readily. Talc for instance is an extremely hygroscopic filler used in conventional polyester car body putty and accounts for the rapid deterioration of this material when immersed.
<i>Inboard</i>	Toward the centre of a vessel or inside her deck edge. Often colloquially used for an engine fitted inside a boat.
<i>In-line, Inboard Engines</i>	A centrally mounted inboard engine with the propeller shaft usually coming directly off the engine or transmission; in-line with the engine.
<i>Inboard/Outboard</i>	A propulsion system that uses an inboard motor, mounted at the transom, with a propeller assembly, similar to the bottom of an outboard motor, mounted on the outside of the transom, bolted to the motor with the transom sandwiched between. Also called a stern drive. In most designs it can be used optionally to a V or jet drive.
<i>Independent Tank</i>	A self supporting tank not built in as part of the vessel's structure.
<i>Inflatable</i>	An abbreviation for inflatable boat or dinghy.
<i>Initial Stability</i>	The stability of a vessel in the upright position and measured by the Metacentric Height (GM). (q.v.)
<i>Inner Bottom</i>	See <i>Double Bottom</i> and <i>Tank Top</i> .
<i>Inner Chine Log</i>	See <i>Chine Log</i> .
<i>Inner Stern Post</i>	See <i>Apron</i> .
<i>Inspection Port</i>	A watertight covering, usually small, that may be removed so the interior of the hull can be inspected or water removed.
<i>Intercostal</i>	A term sometimes loosely applied to an intercostal side girder and sometimes to an intercostal plate. See <i>Girder</i> .
<i>Intercostal Side Girder</i>	A girder fitted intercostally between the floors of a metal vessel and some distance off but parallel to the <i>Centre Girder</i> (q.v.). Often simply called intercostals.
<i>Inverted Angle</i>	See <i>Toe Welded</i> .
<i>Inverter</i>	An electrical power unit which converts square wave dc current to sine wave ac current.
<i>Inwale</i>	A longitudinal secondary main structural timber fitted inside the heads of the frames or timbers and under the capping to form the vessel's gunwale. Also the name for the <i>Beam Shelf</i> (q.v.) in a wooden barge. In America it is called the <i>Rail Clamp</i> .

Iron Topsail or Spinnaker

A bargee or yachtsman's name for an auxiliary engine.

Jalousie

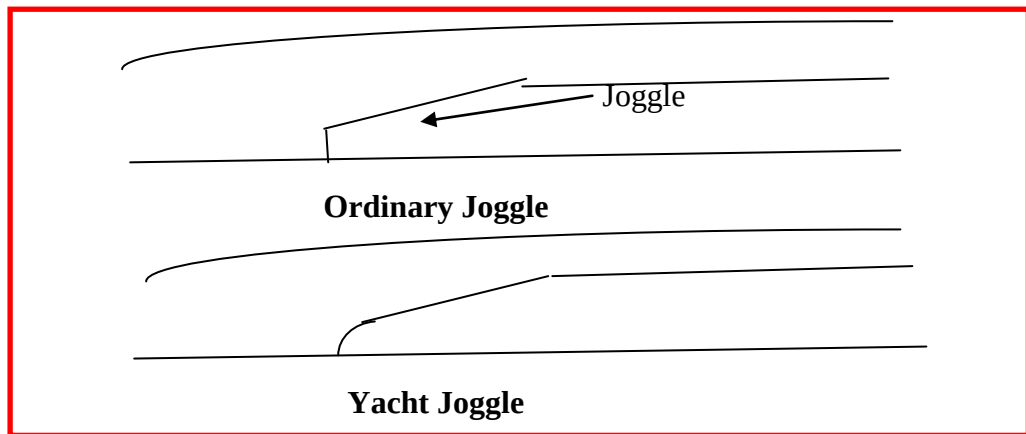
A slatted gill in a door or the sides of a deck house to facilitate ventilation.

Jerrold

See *Gerald*.

Joggle

(1) A piece of decking joined to a margin strake or covering board by a snipe with the end snubbed is said to be joggled.



Definition of Deck Plank Joggles

(2) Similarly, a metal frame locally deformed so that its flange fays closely over the land of a shell seam or the seam edge of a plate which is locally deformed to allow the inner surface to fay closely to a plain (unjoggled) shell frame are also said to be joggled.

Joint

The junction of two pieces of wood or veneer. The marine surveyor should be familiar with the various types of joint described in the text and the following general descriptions: -

- i. *Butt Joint*: An end joint formed by butting together the squared ends of two pieces of wood.
- ii. *Edge Joint*: The place where two pieces of wood are joined together edge to edge usually by gluing. The joints may be made by gluing together two square edges or by using machined joints as in tongue and grooved timber.
- iii. *Scarph Joint*: An end joint framed by joining with mechanical or glued fastenings the ends of two pieces that have been tapered (or tabled) to form a sloping plane surface of the same length in both pieces. In some cases a step or hook may be made into the scarph to add to the strength.
- iv. *End Joint*: The place where two pieces of wood are joined together end to end commonly by scarphing and gluing.
- v. *Lap Joint*: A joint made by placing one piece partly over another and bonding together the overlapping portions.

- vi. *Starved Joint*: A glued joint that is poorly bonded because an insufficient quantity of glue remained in the joint. Starved joints are caused by the use of excessive pressure or insufficient viscosity of the glue, or a combination of these, which result in the glue being forced out from between the surfaces to be joined. The term should only apply to epoxy glues. Joints made with other waterproof or water resistant glues such as resorcinol and urea-formaldehyde (brown glue) should be starved for maximum strength

<i>Jollyboat</i>	The ship's boat, used when the barge is moored off, for ferrying provisions, crew, <i>etc.</i>
<i>Junk Clinker</i>	A method of planking a boat where the top of the lower plank overlaps or hems the lower edge of the plank above. The opposite method of clinker building to that found in Europe and America.
<i>Jury</i>	Makeshift <i>e.g.</i> as in a jury rudder – an emergency arrangement to steer after damage to the rudder.
<i>Kedge Anchor</i>	An anchor used for warping. Also called kedger or cadger. Also used trailed behind a boat moving stern first with the tide to slow the boat down and give steerage and action called drugging on the Thames.
<i>Keel</i>	The primary main structural longitudinal member or backbone at the lowest point of the hull and, together with the hog and keelson (if fitted) forms the vessel's back bone. In a metal vessel the keel may be manufactured from a solid bar attached to the garboard strakes or from a flat plate called, respectively, a bar keel and a flat plate keel. A large heavily weighted fin like structure secured to the bottom of the vessel which helps to keep the vessel upright and also reduces leeway when it is described as a ballast keel.
<i>Keel Batten</i>	An American term for the Hog (<i>q.v.</i>).
<i>Keel Drag</i>	Another name for the <i>Rise of Keel</i> (<i>q.v.</i>). See <i>Drag</i> .
<i>Keelson</i>	A primary main structural longitudinal member usually, in a wooden boat, sitting on top of the floors to which it is bolted. It runs between the forward and the after deadwoods. In a metal vessel it is usually a vertical continuous longitudinal plate structure fitted at the centreline of Sometimes spelled or pronounced Kelson.
<i>Keel Trunk</i>	An American term for the hollow part of a moulded frp or steel fin keel.
<i>Kentledge</i>	Loose pig iron pieces form a vessel's ballast.
<i>Kerf, to (Verb)</i>	To cut or make a channel with the blade of a hand saw.
<i>Kevel</i>	A short piece of non structural timber fitted inside the timber heads for use for tying off mooring or rigging lines. In America called a <i>Lashing Rail</i> .
<i>Kicking Chain</i>	A chain rigged from rudder to a barge's quarter. When it is hove tight

<i>or Strap</i>	while lying at anchor the rudder is prevented from kicking on its gudgeons.
<i>Kiln Dried</i>	Timber placed in a special kiln and dried by the forced passage of hot air.
<i>Kick Up</i>	Describes a rudder or centreboard that rotates back and up when an obstacle is encountered.
<i>King Plank</i>	The primary main structural extra wide and often thicker deck plank laid on the vessel's centreline in a sprung or swept deck and into which the ends of the decking planks are joggled.
<i>King Post</i>	A solid vertical post fitted on the centreline forward with its top standing well above the deck, fitted with a through bolt just below its head and used as a forward mooring post.
<i>King Spoke</i>	The spoke of steering wheel either larger than the other spokes or marked with a brass cap or rope toggle to show, when in the 12 o'clock position, that the rudder is centred (<i>i.e.</i> amidships).
<i>Knee</i>	In wooden vessels tiercery supporting pieces usually made out of timber which has grown with a suitable natural curve fixed part the way up the side forming joining brackets between the deck beams or beam shelves and the main timbers and were there to strengthen the deck edge corner. They are sometimes called beam knees. They were generally of three types: -

- i. *Hanging Knees* which hung vertically from the underside of the beam and fayed solidly against the inside of the timber or frame in way.
- ii. *Lodging Knees* which fay against the side or underside of a deck beam and extend horizontally along and fay solidly to the inside of the beam shelves. Sometimes used to support the ears of a bulkhead.
- iii. *Dagger Knees* which are identical to hanging knees but set at an angle to the vertical.
- iv. If the angle between the arms of the hanging knee is less than 90° then it is often called a *Bosom Knee* or, in America, an in square knee. If greater than 90° an out square knee.

The short leg of the knee is generally called the root and the long leg the trunk as these are the positions in the stump of the tree from which the knee is cut.

The name knee is also given to omega section transverse frames found in the older traditional riveted or wooden working narrow boats.

Composite craft and narrowboats may have wrought iron or steel knees made with a corrugated section to provide rigidity to the plate keel. In metal boats, tiercery pieces forming joining plates between the end of the

beams and the top of the frames. Such are more correctly called beam brackets.

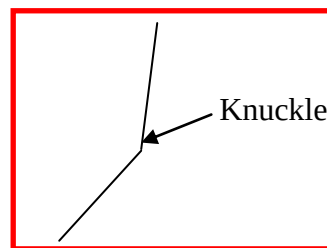
Knightheads The knightheads are the forwardmost primary main cant timbers and are fitted one either side of the apron or stomach piece. They extend upward through the covering board and on past the top of the caprail in way and were often carved decoratively to form the head of a man wearing armour. Sometimes called Apostle Timbers.

Knighthead Plate A plate either side at the fore end of a topgallant forecastle, on an iron or steel sailing ship, through which the bowsprit passes.

Knot A unit of speed of one nautical mile per hour. One nautical mile is 1.152 statute miles. It is incorrect to speak of knots per hour as that is an acceleration.

That portion of a branch or limb of a tree which has been surrounded by subsequent growth of the wood of the trunk or other part of the tree. As a knot appears on the surface of sawn timber it is only a portion of the entire knot and its shape depends upon the direction of the cut.

Knuckle A line drawn through a point of sharp change of shape or curvature on the adjacent above water transverse sections of a vessel.



Definition of a Knuckle

Knuckle Line This is the locus of the intersections of the two parts of the hull form at the knuckle. It appears as curvilinear in the profile, body and the half breadths plans. See *Lines Plan*.

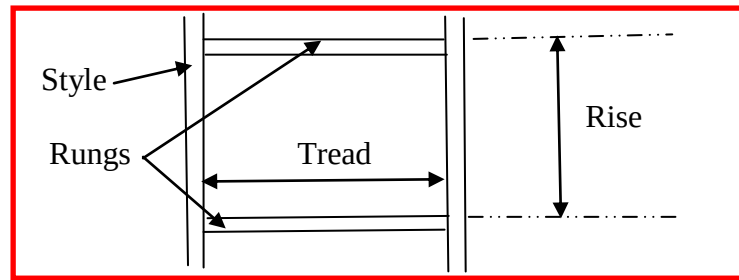
Knuckle Timbers Specially shaped cant timbers in way of a forward knuckle. Probably obsolete.

Kort Nozzle A hydrofoil sectioned ring fitted round a propeller to increase the thrust at low speeds and often found on trawlers and tugs. It comes in two forms: -

- i. *Fixed*, where the nozzle is welded to the hull.
- ii. *Rudder*, where the nozzle is attached to the rudder stock and turns with it.

Lacing Piece The lacing piece is a secondary main piece of compass timber forming the top of the leading edge of a built stem and running from the top of the cutwater to the underside of the figurehead or stem badge. It forms the stop for the forward end of the gammon piece. See *Stem*.

Ladder A simple vertical means of ascending from one level to another within a vessel. May be of wood or steel tubular construction. See *Stair*.



Parts of a Ladder

Laminate (Verb) To make a piece up by gluing together successive thin pieces of wood or (Noun) a piece made up so.

Land The overlap of a seam or a butt in plating or planking.

Land Rail Quarter round pieces of timber nailed under the plank lands of a clinker built wooden boat.

Landing Strake The strake of skin planking next below the sheer strake but the name is usually confined to small boats.

Laps The remaining part of the ends of *Carling Beams* (q.v.) which are to bear a great weight or pressure.

Lap Joint A joint between two structural members that overlap each other. When this is done in a vessel's shell plating it is said to be clinker (or clencher) built.

Lap Over, to (Verb) *Mast Partners* (q.v.) are said to lap upon their beams by reason of their great depth and *Head Ledges* (q.v.) at the ends lap over the *Coamings* (q.v.).

Lap Strake An American name for *Clinker Build* (q.v.). Sometimes called *Shiplap* (q.v.) in America.

Lashing Rail An American term for a *Kevel* (q.v.).

Lateral Plane The projected underwater side area of the hull including the keel and rudder. It is the area available to resist leeway.

Launch A large, open motorboat.

Laying Off Also called laying down. Setting out the lines plan of a vessel full size on the mould loft floor.

Lazarette A void space in the counter or abaft the cockpit often used for storage.

Leak A boat is said to leak when there is an inflow of clearly visible running water through the deck or the skin.

Leathers Pieces of leather that are stitched and/or tacked around an oar to protect it where it rides in the *Rowlock* (q.v.). They usually have a stop or button to keep the oar from sliding out of the rowlock when left

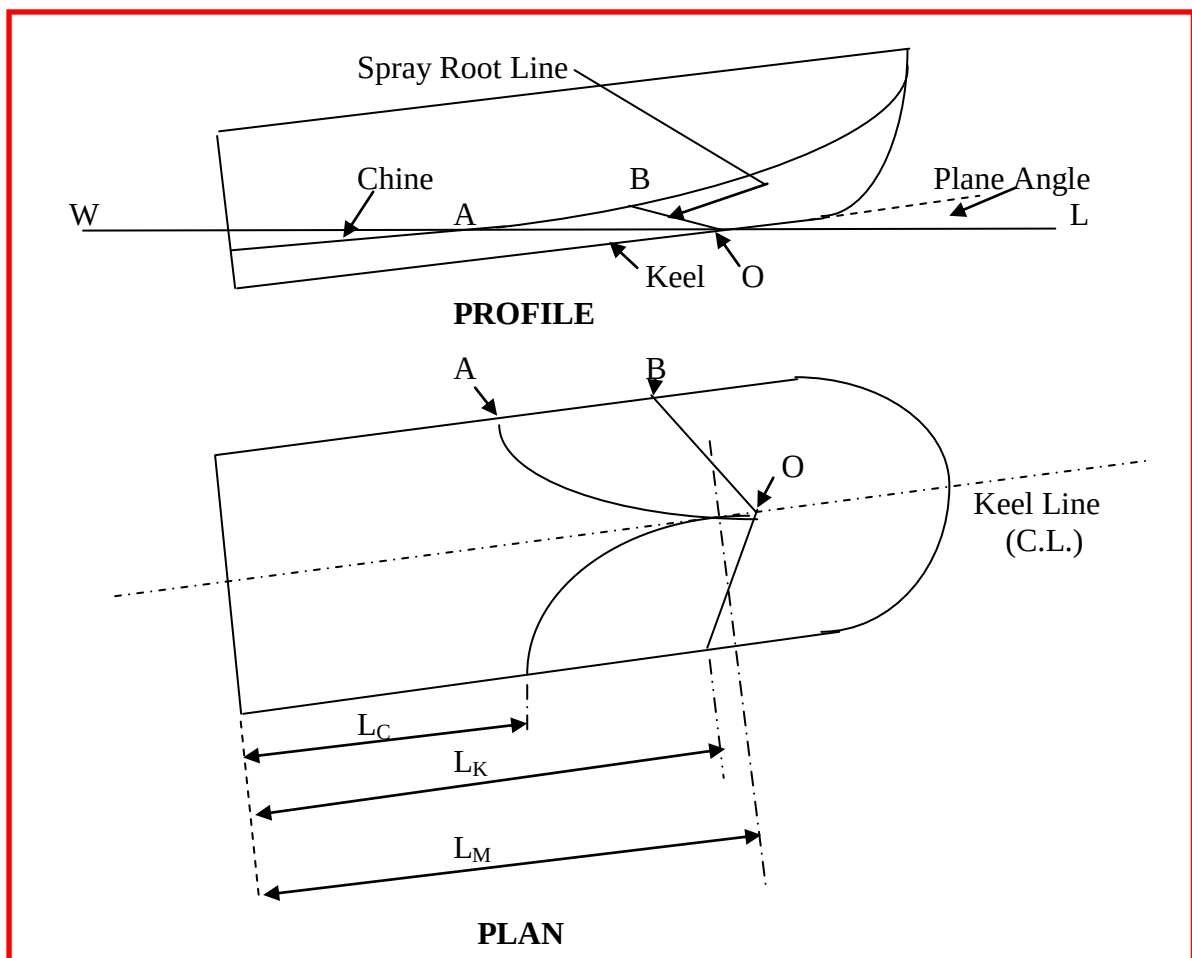
unattended. The button can be a thin strip of leather or knotted twine that is tacked and/or glued in place on top of the leather at the handle end of the oar.

<i>Ledged Chine</i>	A chine where the surface forming the bottom of the hull moves inward horizontally a short distance before curving down to the keel line. Sometimes (incorrectly) called a <i>Lifting Chine</i> (q.v.).
<i>Ledges</i>	Half scantling short beams laid between the beam shelf and the carlings to support the outer deck planking. (Largely obsolete).
<i>Leeboard (1)</i>	Pronounced <i>Leeb'd</i> . A large paddle shaped steel framed wooden board fitted at each side of a sailing barge and pivoted at deck level at its forward end and lowered by means of a wire attached to its free end. When the board on the lee side is lowered it increases the effective lateral plane area of the barge and serves to reduce the amount of the vessel's leeway when sailing close hauled. It operates in much the same way as the centreboard of a dinghy.
<i>Leeboard (2)</i>	A deep solid board fitted to the side of a bunk to prevent the occupant being dumped when the vessel is heeling in a seaway.
<i>Leeboard Irons</i>	Iron bars running from a strap by the mainmast case to the head of each leeboard and by which means the leeboards are supported.
<i>Leeboard Pendant</i>	A wire or chain connecting the leeboard to a single whip purchase, the fall of which is led to a crab winch on the barge's quarter. The end of the pendant is shackled about half way down the fan of the leeboard.
<i>Leeward</i>	Pronounced <i>Loo'ard</i> . The opposite side of the vessel to that from which the wind/weather comes. The downwind side.
<i>Length</i>	The length is longitudinal distance between the stem and the stern of the vessel and defined in a number of ways: - - The <i>Length Between Perpendiculars</i> (L_{BP}) is the longitudinal distance between the point where the forward edge of the stem crosses the water datum water line and the after side of the stern post or the centreline of the rudder stock if no stern post is fitted. Often similar to but not to be confused with the <i>Load Water line Length</i>. See <i>Lines Plan</i>. - The <i>Length Overall</i> (L_{OA}) is the longitudinal distance between the extreme forward edge of the stem, bowsprit or pulpit as appropriate and the after end of the stern, boomkin or mast boom also as appropriate. - The <i>Length of Hull</i> (L_H) is the longitudinal distance from the forwardmost tip of the stem to the after side of the transom or stern post excluding any rubbing pieces, sprits or bumpkins. - The <i>Freeboard Length</i> (L_F) is defined by statute and is the distance between the fore side of the stem and the axis of the rudderstock, or 96% of the distance between the fore side of the

stem and the aft side of the stern, the points being taken respectively at and along a waterline at 85 % of the least moulded depth of the vessel. In the case of a vessel having a rake of keel the waterline shall be parallel to the designed waterline. Also called the load line length.

- v. The *Registered Length* (L_R) is defined by statute and actually varies slightly with ship type.
- vi. The *Length on Deck* (L_{DK}) is the distance measured from the after side of the apron or stem bar or inside of the stem plating to the centreline of the rudder stock.
- i. The *Length on the Keel* (L_{KL}) A somewhat old fashioned and probably obsolete although still valid measurement and is the longitudinal distance between the after end of the lower gripe scarph to the after side of the stern post. Sometimes called the Keel's Tread.

For a planing hull the following extra definitions of length are also used (See the Figure 395 below).



Definition of Planing Hull Lengths

- i. *Wetted Chine Length* (L_C) the length of the wetted part of the chine when under way.

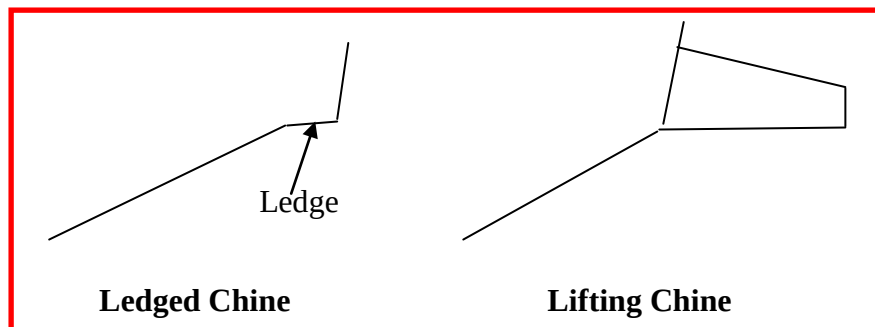
- ii. *Wetted Keel Length* (L_K) the length of the wetted part of the keel under way.
- iii. *Mean Wetted Length* (L_M) the mean length of the portion of the bottom of a planing craft actually wetted when under way.
- iv. *Projected Chine Length* (L_{PR}) the length of the chine projected in a plane containing the keel and normal to longitudinal centre plane.

Level Lines

Water Lines (*q.v.*) drawn above the *Datum Water Line*. (*q.v.*).

Lifeline

Safety lines and supported by stanchions rigged around a boat's deck to prevent the crew from being washed or falling overboard.



Chine Forms

Lifting Chine

Lifting chines (also called chine flats, lifting strakes, planing chines or spray knockers) are secondary fairing timbers fitted to the outside of the chine log and designed to deflect water and spray from the hull and to provide extra dynamic lift by increasing the plane area and thus help to physically lift the hull higher out of the water. See *Ledged Chine* and Figure 396 above..

Light Irons

Iron bars mounted in sockets by the main shrouds which support the light boxes or screens upon which are hung the navigation port and starboard lamps.

Light Screens

Boards on to which the navigation lights are hooked. They are fitted with shields to ensure that the light can only be seen as required by maritime law.

Lighter

A type of unpowered dumb barge (with swim ends, in the Thames area). Often limited to dock and harbour work handling cargo between local wharves and ships and used to take cargo from a ship and so lighten her.

Lightening Holes

Holes cut into a non watertight piece of structural plate such as a floor or web frame in order to reduce her as built steel weight.

Limber

A drainage hole in the bottom of the floors or floor timbers that allows water to drain to the lowest point in the hull - often called rat holes. The portable ceiling board covering the area in way are called limber boards or the limber strake.

<i>Lining</i>	Light planking fitted inside the frames or timbers and forming an inner skin to the vessel. It may be close laid forming a complete surface or open spaced when it is said to be laid room and space and the vessel is said to be spar lined.
<i>Lines Plan</i>	A primary design drawing showing the shape of the vessel at level and water lines, transverse sections and longitudinal bow and buttock and diagonal lines from which the naval architect carries all necessary design calculations. By tradition, the bow is always shown to the right so that the profile shows the starboard side of the vessel. i. <i>Level Lines</i> are shown as horizontal straight lines above the load or datum water line in the profile and body plan and curved lines in the half breadth plan. ii. <i>Water Lines</i> are shown as horizontal straight lines below and including the load or datum water line in the profile and body plan and curved lines in the half breadth plan. iii. <i>Transverse Section Lines</i> are shown as vertical straight lines in the profile and transverse straight lines in the half breadth plan and curved lines in the body plan. iv. <i>Bow and Buttock Lines</i> are shown as horizontal straight lines in the half breadth and body plans and curved lines in the profile. v. <i>Diagonal Lines</i> are for fairing purposes only and show as angled straight lines in the body plan and are usually plotted separately as curved lines below the half breadth plan. The level and water lines and the transverse sections are usually spaced to facilitate the use of Simpson's Rules (at the so-called displacement stations) in calculating the hydrostatic data of the hull. Transverse sections drawn anywhere else other than the displacement stations are called transverse frame or bulkhead sections as appropriate.
<i>Lip</i>	The squared off end of a scarph or a tapered or joggled piece of decking. Also (in America) called a nib.
<i>List</i>	When looking end on, the angle at which a boat sits from the vertical caused by <i>e.g.</i> imbalance of ballast or loading or through shipping water. See also <i>Heel</i> and <i>Trim</i> .
<i>Load Water Line</i>	(LWL) Also called the load water plane or the <i>Designer's Water Line</i> . See <i>Datum Water Line</i> .
<i>Locking Clamp</i>	A second clamp fitted inside the normal beam clamp and checked into and/or over the beams in the same manner as a <i>Binding Strake</i> (q.v.).
<i>Locking Strake</i>	The American term for a <i>Binding Strake</i> (q.v.).
<i>Lofting</i>	Lofting is the process of drawing the hull lines full size on the mould loft floor from the designer's scale drawings. The intersections of the contours of various horizontal and vertical sections are measured from

an imaginary base line using a naval architect's scale. These junctions are then laid out, point by point, to their full size. Because it is difficult to take accurate dimensions from a small drawing, it is necessary to adjust these lines to assure that they are fair. A listing of these points is called a table of offsets. The special building in which this work is carried out is called a *Loft* from the fact that the moulding floor and scribe board were often laid out in the loft above the drawing office.

<i>Log Rail</i>	American name for a <i>Solid Rail</i> (q.v.).
<i>Longitudinals</i>	Those hull framing members that run the length of the boat (i.e. chine bars, keel, hog, shelf, clamps and stringers). Also, in a metal boat, a fore and aft angle set under the deck beams. See <i>Deck Runner</i> .
<i>Long Timbers</i>	In a built frame the lowest futtocks of the forwardmost cant timbers were often made in one piece from the deadwood to the top of the second futtock and were called long timbers.
<i>Long 'uns</i>	London River term for the longitudinal carvel planks laid either inside or outside of double diagonal or Ashcroft planking to form a triple skin.
<i>Luff</i>	The fullest or roundest part of the bow.
<i>Lum</i>	The Scots name for the funnel.
<i>Lumber</i>	See <i>Timber</i> (2).
<i>Lutchet</i>	An open sided box similar to a Tabernacle (q.v.) holding the heel of a mast and was built so that the mast could be lowered for shooting a bridge. Sometimes found on Dutch Barges and Boats built for the Norfolk Broads.
<i>Luting</i>	<i>Bedding</i> (q.v.) material.
<i>Maierform Bow</i>	A special for of bow shape with a sharply cutback fore foot and (approximately) triangular forward sections. Some times, incorrectly, called an ice breaker bow.
<i>Main Rail</i>	See <i>Cap Rail</i> .
<i>Main Wales(s)</i>	Extra thick planking fitted either side of the Load Water Line (q.v.).
<i>Margin Plate</i>	The outermost strake of the inner bottom or tank top and when turned down at the bilge the plate (or girder) forms the outer boundary of the double bottom tank. See <i>Double Bottom</i> .
<i>Margin Strake</i>	The deck plank fitted next to a hatch coaming or superstructure or that fitted to the outer edge of a deck where it does not form a covering board.
<i>Margin Line</i>	A theoretical line drawn 3" (75 mm) below the freeboard deck to which the vessel is allowed to sink when carrying out <i>Floodable Length</i> (q.v.) calculations.
<i>Marina</i>	Small harbour specially built to hold pleasure boats.

<i>Marine Glue</i>	See <i>Glue</i> .
<i>Mast Boot</i>	See <i>Coat (Mast)</i> above.
<i>Mast Case or Box</i>	An iron deck fitting on a sailing barge in which the heel of the mast is mounted. Sometimes with a hinge fitting so that the mast can pivot and be lowered easily when passing under bridges and high tension wires. See <i>Lutchet</i> and <i>Tabernacle</i> .
<i>Mast Partners</i>	Extra strong primary heavy transverse primary structure main structural transverse beams (2) fitted under the deck in way or either side of the passage of the mast through the deck or at the heel of the bow sprit where they are called sprit partners to carry the weight of these items. Always fitted in pairs.
<i>Mast Step</i>	The block or recess onto or into which the mast is located.
<i>Mathematical Lines</i>	Methods of designing the lines of a ship's hull form based upon parabolae and hyperbolae. The two main forms were due to F.W. Benson and Admiral D.W. Taylor. They have been superseded by the B-Spline method using computers. See <i>Geometrical Lines</i> .
<i>Mechanical Advantage</i>	A mechanical method of increasing an applied force usually described as a ratio.
<i>Metacentre</i>	A theoretical point on the vessel's centreline where, when she is heeled, a vertical line through the centre of buoyancy crosses <u>her</u> upright centreline. Its height above the vessel's centre of gravity (GM) gives a measure of her <i>Initial Stability</i> (q.v.).
<i>M.F.V.</i>	Motor fishing vessel.
<i>M.I.C.</i>	Microbially Induced Corrosion. See <i>Biological Attack</i> iii.
<i>Midships</i>	Approximately in the location equally distant from the bow and stern.
<i>Midship Bend</i>	See <i>Midship Section</i> .
<i>Midship Section</i>	The transverse cross-section of the hull exactly halfway between the two perpendiculars and Station 5 on the <i>Lines Plan</i> (q.v.) and one of the five <i>Fundamental Lines</i> (q.v.) of a vessel's design. Sometimes called by the probably obsolete name of <i>Midship Bend</i> . See <i>Lines Plan</i> .
<i>Molgogger</i>	A vertical hook or bar sometimes fitted with a roller and fitted each side of the after end of a tug's superstructure and designed to prevent to tow line moving forward and turning the tug over on her side - a risk called girting. Also called a Norman pin. Sometimes in the form of a hook.
<i>Monkey Deck</i>	A false deck built over a permanent deck. Often used in the bow of the larger sailing ships, forward of the anchor windlass and providing a working platform around the portion of the bowsprit where it attaches to the ship.
<i>Monkey Rail</i>	An American term. See <i>Buffalo Rail</i> and <i>Fashion Piece</i> .

<i>Monkey Island</i>	Along the London River the name for the top of the wheelhouse.
<i>Monocoque</i>	This is a hybrid Greek/French word meaning single shell in and is a construction technique that utilises the external skin to support some or most of the load on the structure. It is commonly used in frp dinghies, kayaks and similar small craft.
<i>Monohedron</i>	From the Greek words $\mu\omicron\nu\omicron$ (mono) meaning one or single and $\eta\delta\rho\omicron\nu$ (hedron) meaning a geometrical figure having any number of planes. The theoretical ideal shape for planing over the water surface is one of constant section. Thus monohedron describes a hull that has a running surface of constant section although, in practice, the sections may not be exactly the same.
<i>Mooting</i>	Making a treenail exactly cylindrical to a given size or diameter called the moot. Hence, when so made, it is said to be mooted.
<i>Motor-Sailer</i>	A compromise combination of sailing boat and motor boat and not the ideal in either category.
<i>Motor Well</i>	When an outboard motor is mounted on the transom, a motor well is a box like structure forward of the motor that catches water that may wash over the outboard cut out and allows it to drain over the transom and not into the boat. When a motor is mounted ahead of the transom, the term refers to a box like structure that surrounds a hole in the bottom of the boat. The well usually allows the motor to tilt up, frequently through a cut out in the transom. This type of motor well allows the handling of nets or fishing lines over the transom without having to work around the motor.
<i>Mould</i>	A light wooden temporary structure defining the shape of a piece of the vessel's structure. By tradition the term mould is usually only applied to structure used for shaping frames, stringers and other structural items moulded to shape and whereas 'moulds' made for plates are termed templates.
<i>Moulded Breadth</i>	In a wooden or an frp boat the maximum distance across the vessel to the outside of the planking or gel coat excluding any wales or rubbing strakes. On a metal vessel the distance is measured to the outside of the frames and inside the shell plating.
<i>Moulded Depth</i>	The distance at the lowest point of the sheer line to the keel rabbet in a wooden boat, the underside of the keel gel coat in an frp boat and the top of the keel plate in a metal boat.
<i>Mould Loft</i>	A large, well lit building in a shipyard with a specially built wooden floor painted matt black upon which the vessel's lines are laid down and faired full size. See <i>Fairing</i> , <i>Lofting</i> and <i>Scrive Board</i> .
<i>Moulded Surface</i>	The surface of the hull which defines the vessel's shape and to which the lines are drawn and all hydrostatic calculations are made. On a wooden, frp and ferrocement vessel it is the outer surface of the hull but on a

	metal vessel it is the faying surface between the frames and the inside of the shell plating.
<i>Moulding</i>	The dimension of a timber or frame lying normal to the moulded surface of the hull.
<i>M.S.D.</i>	An Americanism. A Marine Sanitation Device. See <i>Heads</i> .
<i>M.T.B.</i>	Motor torpedo boat.
<i>Mullion</i>	The vertical dividing piece between the panes in a glazed window.
<i>Multi-Chine</i>	Having a number of planking junctions between the keel and the deck edge.
<i>Multi-Diagonal</i>	A form of planking which is more involved and used when compound shapes are incorporated into the hull and uses strips of solid wood veneers laid over the hull in layers of opposite diagonals, stitched and glued together usually with an epoxy.
<i>Multi-hull</i>	A vessel with more than one hull such as a catamaran or a trimaran.
<i>Mushroom</i>	The button forming the outer end of a leeboard hinge pin.
<i>Muzzle</i>	The iron band, which, together with the links, holds the sprit heel to the mast on a London River sailing barge.
<i>Nacelle</i>	A small swelling below the bridge deck in some catamarans and trimarans to accommodate the helmsman's feet.
<i>Nail Sick</i>	A form of electro-chemical corrosion of the fastenings most commonly found in but not confined to vessels built of oak with iron spikes.
<i>Narrowing</i>	(<i>of the Transom</i>) The term is applied to the reduction in breadth when moving aft from the <i>Midship Section (q.v.)</i> . The forward narrowing (rare) was the reduction in breadth towards the stem. Both obsolete.
<i>Narrowing Line</i>	Line in the half breadth plan showing the reduction in width of the flat of floor moving forward or aft from the midship section. (Largely obsolete).
<i>Navel Frames</i>	Short intermediate secondary supporting transverse frames or timbers fitted to the bilges of London River and other barges to help resist wringing.
<i>Navel Pipe</i>	See Spurling Pipe.
<i>Necking</i>	Is wastage of wood fastenings when used to fasten planking to frames or timbers and always starts at the nail or screw's centre dues to the capillary effect caused by the tendency of water to follow along cracks, seams or fissures. The water also tends to follow the threads of a screw right up and down the screw's shank. The oxides on the screw's surface further enhance the capillary effect. Also the reduction in thickness of shell plating at a vessel's shoulders due to varying pressure changes as she moves through the water.

*Newton's
Differential
Equation*

This is a complicated mathematical expression that, in effect, describes the action of all time dependent natural processes. It is a simple first order differential equation. For the record the basic equation is given here together with its most important solution: -

$$y = \frac{a - b.dy/dt}{c} \quad (229a)$$

The solution of this differential equation that describes *inter alia* the drying out of a non hydrolysed plastic hull is: -

$$y = A + Be^{-kt} \quad (231b)$$

The standard values of A, B and k given in the IIMS Code of Practice and which are based on the author's experience are: -

$$\begin{array}{rcl} A & = & 10 \\ B & = & 15 \\ k & = & 1/100 \end{array} \quad \begin{array}{l} - \\ - \\ - \end{array}$$

Nib

The American term for the *Lip* (q.v.) of a scarph.

Nobbing

See *Frenching*.

Nominal Value

A value assigned for the purpose of a convenient designation and which exists in name only. It is often an average number with a tolerance so as to fit together with adjacent parts.

*Non-Destructive
Test (NDT)*

Testing carried out without damage or modification to the item under test and broadly considered synonymous with non-destructive inspection (*NDI*).

Norman Pin

A fixed *Molgogger* (q.v.). Also the name for a square pin thrust into one of the handspike holes of a ship's windlass. When at anchor, the anchor rope cable was secured to this with a smaller rope tie called a seizing.

Nose

A colloquial name for the *Stem* (q.v.).

Nose Block

Solid block of timber at the forward end of the deck king plank and to which the covering board and waterway are sniped or joggled.

Oakum

A caulking material of loosely twisted hemp or jute or other crude fibre sometimes treated with creosote or tar before use.

Oar

An implement in the form of a lever used for moving a boat without sails or an engine. Usually used in pairs.

Oarlock

The American name for a *Rowlock* (q.v.).

Obtuse Angle

Often called Blunt or Dull in opposition to acute or sharp. An obtuse angle without a square or right angle is said to be so. Such angles are called by shipwrights standing bevelling.

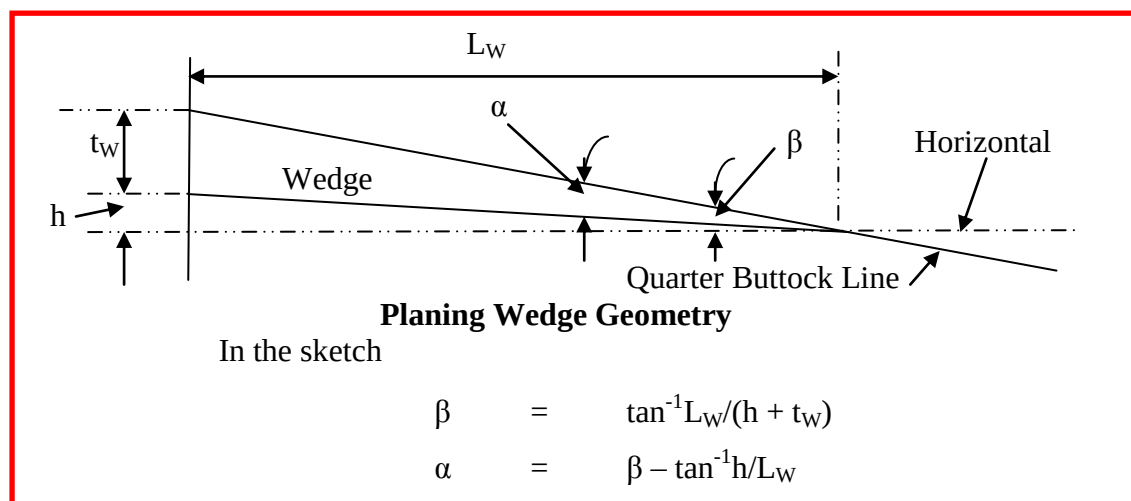
Offsets

Measurements supplied by a designer to the builder to enable the latter to lay down or loft the lines of the hull full size.

<i>Open Floor</i>	Floors in a metal vessel not fitted with a tank top, only a wooden ceiling. Usually found only in the smaller vessels.
<i>Outboard</i>	Toward or beyond the vessel's sides. Also used colloquially to describe a small detachable engine mounted on a vessel's stern – short for outboard motor.
<i>Out Square</i>	Any obtuse angle or standing bevelling is said to be out-square. This term is however most often applied to knees when the angle the arms make is greater than 45 degrees.
<i>Outer Chine Log</i>	See <i>Chine Log</i> .
<i>Outrigger</i>	A Scots name for the <i>Horn Timber</i> (q.v.). Also a structure built outboard of a boat. In rowing boats it is a bracket which carries the rowlock crutch outboard of the hull and it is also the name for a spar held to leeward and parallel to the hull to increase the stability of some traditional native craft.
<i>Overboard</i>	Over the side or out of the boat.
<i>Overhang</i>	The forward and after ends of a boat projecting beyond the ends of the designer's or load water line.
<i>Owner's Manual</i>	An approved booklet which gives details of the vessel's layout, maintenance guidelines, tank capacities and other similar information with which all boats subject the requirements of the RCD should be supplied.
<i>Oxter Plate</i>	The shell plate at the point where the stern frame of a metal vessel enters the hull.
<i>P Bracket</i>	See <i>Shaft Bracket</i> .
<i>Pad Eye</i>	An American name for a metal eye or ring with a substantial base attached to the deck or cabin top used to secure fittings such as blocks through which lines can be passed in order to stop chaffing. See <i>Eye Bolt</i> .
<i>Palings</i>	The inner planks on a double diagonally, Ashcroft or double carvel built wooden boat.
<i>Panama Fairlead</i>	A fairlead with a closed top – essential where used in a dock or harbour with a large rise and fall of tide. See <i>Fairlead</i> .
<i>Panel</i>	The designation of an area of frp or steel shell plating of either single skin or sandwich construction bounded by longitudinal and transverse stiffeners or other supporting structures.
<i>Panting</i>	This is a fluctuating strain which occurs at the ends of a ship due to variations in water pressure on the shell plating as she pitches in a seaway and which tends to create an in and out movement of the shell plating and which is accentuated at the bow when making headway.
<i>Panting Frame</i>	Frames fitted in the <i>Fore Peak</i> (q.v.) and the <i>After Peak</i> (q.v.) to resist the effect of the vessel <i>Panting</i> (q.v.) in a head sea.

<i>Panting Stringer</i>	A secondary supporting stringer fitted at the forward end of the vessel to stiffen the hull structure forward against pounding in a seaway.
<i>Parallel Mid Body</i>	The middle length of the vessel's under water body between the <i>Entrance</i> (q.v.) and the <i>Run</i> (q.v.) where the buttock lines and water lines or water planes are straight and parallel.
<i>Partners</i>	See <i>Mast Partners</i> .
<i>Passerelle</i>	The French name for a <i>Brow</i> (q.v.).
<i>Pawl</i>	A catch used on a capstan to stop it turning backwards.
<i>Pay, to (Verb)</i>	To pour into or fill up a seam with pitch, tar or other hot sealant so that it is level with the top of the plank. When putty or a similar substance which does not require heat is used both the task and the material are called stopping.
<i>Peak Exposure Value</i>	An exposure concentration of limited duration.
<i>Pedestal</i>	A vertical post in the cockpit used to elevate the steering wheel into a convenient position.
<i>PEL</i>	Permissible Exposure Level.
<i>Peening</i>	<i>Frenching</i> (q.v.) a rivet using the ball pein of a hand hammer.
<i>Pendant or Pennant</i>	A short length of wire or chain hooked on to a tackle <i>e.g.</i> on the leeboards.
<i>Perpendiculars</i>	Vertical lines drawn through the forward face of the stem where it crosses the datum waterline and a similar line drawn through the after face of the stern post where that crosses the datum water line or, where no stern post is fitted, the centre line of the rudder stock. See <i>Length Between Perpendiculars</i> (L _{BP}).
<i>Pillar</i>	A tiercery structural supporting piece fitted vertically between the underside of a deck beam and the associated bottom floor to transfer the load from the deck down to the (stronger) bottom structure.
<i>Pilothouse</i>	The American name for the Wheelhouse, a small cabin on the Bridge deck of a ship that protects the steering wheel and the helmsman.
<i>Pinhole</i>	Tiny holes in the gel coat of an frp boat usually caused by the escape of entrapped air.
<i>Pinkie</i>	Sometimes applied to a sharp sterned skiff but more properly to a stern projection of the gunwales to a sharp point above a narrow transom, originally designed to carry a coat of arms or other decoration.
<i>Pintle</i>	The male pins attached to the rudder or, sometimes to the boat, which fit into the gudgeons thereby forming a hinge allowing the rudder to pivot.
<i>Pin Rail</i>	A longitudinal rail fitted near the shrouds to take the belaying pins for the running rigging, See <i>Fife Rail</i> .

<i>Pipe Cot</i>	A, usually temporary, bunk made up of strong material supported by metal poles, easily dismantled and stowed to clear area during the day.
<i>Pipe Tunnel</i>	A void space running in the midship fore and aft lines between the inner bottom (tank top) and the shell plating forming a protective space for bilge, ballast and other pipe lines extending from the engine room to the holds and other spaces. See <i>Duct Keel</i> .
<i>Pitting</i>	Holes in the surface of metal usually caused by galvanic, electrolytic or microbially induced corrosion.
<i>Planing</i>	A boat is said to be planing when it is essentially moving over the top of rather than through the water.
<i>Planing Hull</i>	A hull that lifts and skims the surface of the water causing the stern wake to break clean from the transom. In practical terms, a planing hull has a speed potential limited only by weight and power. See <i>Displacement Hull</i> and <i>Hull Form</i> .



Definition of a Planing Wedge

<i>Planing Wedge</i>	A wedge shaped appendix underneath and at the after end of a planing hull's bottom designed to reduce trim and increase the planing efficiency of the hull. If fitted, the marine surveyor should record their presence, dimensions and condition.
<i>Plank</i>	A length of squared wood that form the strakes of the skin or the deck.
<i>Plank on Plank</i>	See <i>Girdling</i> .
<i>Plank Sheer</i>	An American name for the <i>Covering Board</i> (q.v.).
<i>Plating</i>	Sheets of metal, generally simple flat pieces but may be formed into complex curvatures. The name is often colloquially applied to a vessel's shell. It is usually differentiated in bulkhead, deck and side plating and may be either carvel or clinker laid.
<i>Plim, to (Verb)</i>	To swell up. Used of wooden boats where the planking swells as it takes on water after the boat has been launched.

<i>Plimpsoll Line</i>	Also called the Plimpsoll mark or Load Line mark. A line through a circle to designate the maximum draught to which a vessel may be legally loaded.
<i>Plug</i>	The American name for a dowel or the name for the small item pushed into the drain hole of a wooden dinghy.
<i>Pointers</i>	The American name for <i>Diagonal Rider Timbers</i> (q.v.).
<i>Pont</i>	South African word for a small, flat bottomed wooden pontoon ferry operated by ropes or chains.
<i>Pontoon</i>	A floating box to which boats can be moored in a Marina (q.v.) called a Float in America.
<i>Poop</i>	An enclosed superstructure at the extreme after end of the vessel.
<i>Poop Deck</i>	The first deck above the uppermost or main deck at the after end of the vessel and forming the top of the poop.
<i>Port (1)</i>	The port side is left hand side of the vessel when facing forward. Also a harbour.
<i>Port (2)</i>	An opening glazed hole through the side of the vessel fitted with a deadlight and sometimes called a portlight or (incorrectly) a porthole but, more correctly, a side scuttle or side light.
<i>Porthole</i>	See <i>Port (2)</i> . The word is a tautology and should not be used by a marine surveyor. Also correctly called a <i>Portlight</i> , <i>Sidelight</i> or <i>Side Scuttle</i> (q.v.).
<i>Pop Rivet</i>	A small rivet which uses a special tool to pull a central mandrel up the tube forming the rivet's body forcing it to expand.
<i>Pounding</i>	This is a variable shock load on the foreship bottom due to heavy pitching assisted by heaving as the whole ship is lifted in a seaway. The greatest effect is experienced in the lightship condition.
<i>ppm</i>	Parts per million, a measure of the density of a substance in a specified volume of air.
<i>Pram</i>	A dinghy with a transom at the bow and stern. Dutch <i>Praam</i> .
<i>Preservative</i>	Any substance that, for a reasonable length of time, is effective in preventing the development and action of wood rotting fungi, marine and other borers or harmful insects that cause wood to deteriorate.
<i>Prick Post</i>	An American term for an outer post supporting an outboard rudder.
<i>Primary Supporting Structures</i>	Those items of structure which are considered to be involved in the primary longitudinal and transverse bending of the hull girder such as longitudinals, stringers, girders and transverse side frames and floors.

<i>Prismatic Coefficient</i>	The ratio the hull displacement bears to the displacement of a shape which is the same length as the waterline length of the boat and has the same constant cross-sectional area as the greatest cross-sectional area of the hull.
<i>Profile</i>	A subsidiary drawing on the lines plan showing the starboard side of the vessel and upon which the water lines or planes and the transverse sections show as straight lines but the bow and buttock lines as longitudinal curves. Also called the sheer draught by the Royal Navy. One of the <i>Fundamental Lines</i> (q.v.) that define a vessel's shape. See <i>Lines Plan</i> .
<i>Propeller</i>	Bronze or iron casting with three or four wing like blades support on a shaft from the engine and which, when rotated, provides the force that propels the vessel ahead or astern.
<i>Propeller Post</i>	The upward extension of the forward part of a cast stern frame and to which the transverse floors of the vessel's hull are attached.
<i>Prow</i>	An archaic and obsolete name for (originally) the area on top of the <i>Beakhead</i> (q.v.) deck of ancient Greek galleys and, later, by the Royal Navy for the fo'c'sle deck between the forwardmost guns (bow chasers) and the after side of the apron on wooden warships. These days, used only by the press and yotties (incorrectly) when they mean the cutwater or the stem and, today, the true prow area is called the fo'c'sle head. The term is never used by naval architects, marine surveyors or shipbuilders and is a term to be studiously avoided.
<i>Pulpit</i>	The light rail forming the guard round the bows of a yacht and so-called because it looks similar to the structure in a church from which the incumbent preaches.
<i>Pump Socket</i>	The deck level fitting into which the bilge pump is shipped.
<i>Punt</i>	A flat bottomed inland boat with sloping ends propelled by a pole.
<i>Pushpit</i>	An ugly neologism for the area located at the stern of the vessel which, like the pulpit, is enclosed by a metal railing more correctly called a tubular taffrail. The term is best avoided. See <i>Taffrail</i> .
<i>Quant</i>	A long wooden pole with a fork at one end and a shoulder pad at the other used for propeller barges along inland waterways.
<i>Quarter</i>	The area of the vessel at the after end of the upper deck each side.
<i>Quarter Badge</i>	A decorative block fitted each side of the vessel at the after end of the rubbing strake and containing either a sash for the convenience of the cabin or the representation of it. Commonly decorated with carved work such as marine figures or martial instruments.
<i>Quarter Berth</i>	A berth fitted at the after end of the saloon and extending aft under the counter and usually to one or both sides of the cockpit.
<i>Quarter Deck</i>	The after deck below or in way of the poop.

<i>Quarter Knees</i>	Lodging knees used to join the beam shelf or stringer to the transom.
<i>Quarter Post</i>	A solid post fitted each side aft, often as corner posts inside the cockpit coaming, with its top standing well above the deck, fitted with a throughbolt and used as an after mooring post. If an extension of one of the frame timbers it is called the after bollard timber.
<i>Quarter Transom</i>	The aftermost frame timber each side aft and fitted as a boundary timber to the transom.
<i>Quartering</i>	Sawn timber under five inches square.
<i>Quick Work</i>	Skin planking from the garboard strake to the bilge wale.
<i>Rabbet</i>	A longitudinal channel or groove in a member which received another piece to make a joint. The joint line between the outer surface of the planking and the stem, gripe, keel, stern post and horn timber and sometimes called the outer rabbet. The joint line between the inner surface of the planking and these items is called the inner rabbet.
<i>Rabbet Line</i>	When drawn on the <i>Profile</i> (q.v.) this line forms one of the five <i>Fundamental Lines</i> (q.v.) of a vessel's hull design. See <i>Lines Plan</i> .
<i>Racking</i>	The transverse deformation of a vessel's hull. When a ship is rolling, the accelerations on her structure are liable to cause distortion in the transverse direction. The deck tends to move laterally relative to the bottom structure and the shell on one side to move vertically relative to the other and usually showing itself as displacement of the beams, knees and floors. Its greatest effect is felt when the ship is in the light or ballast condition and it can result in distortion of the brackets and beam knees joining horizontal and vertical items of structure. A vessel is said to be racked if, when viewed end on, she appears to be leaning or tilting over to one side.
<i>Rail Clamp</i>	An American term for the <i>Inwale</i> (q.v.).
<i>Ram Bow</i>	A form of <i>Bulbous Bow</i> (q.v.).
<i>Rasing Knife</i>	A small edged tool fixed in a handle and hooked at its point used for making particular marks on timber and especially on a <i>Scrive Board</i> (q.v.). Sometimes called a scrive knife.
<i>RCD</i>	The Recreational Craft Directive: a directive of standards produced by the European Union to which all boats after the 16th June, 1998 must be built. Boats built solely for private personal use and not sold within five years from completion date are excluded.
<i>Reduced Scantlings</i>	Scantlings in classed vessels that have been allowed to be reduced because approved corrosion control arrangements have been applied.
<i>Register Tonnage</i>	See <i>Thames Measurement</i> and <i>Tonnage</i> below.
<i>Registration</i>	Commercial ships are required by International law to be registered in the country whose flag they fly. This is not required by many countries for pleasure craft although there are some in which it is mandatory.

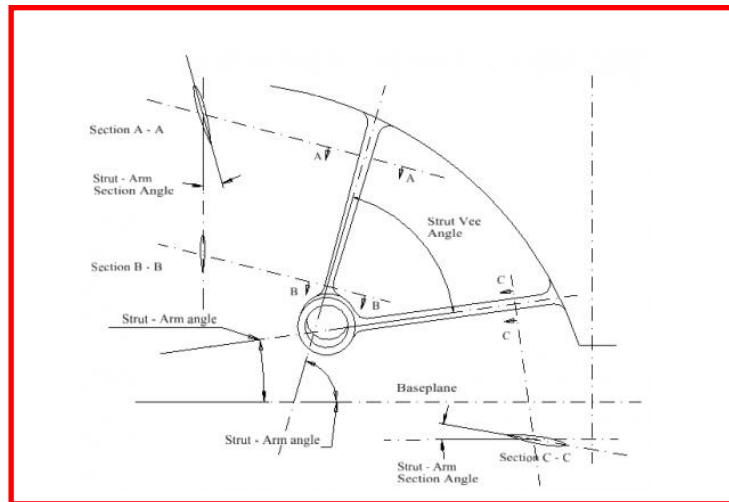
	Boats using British Inland Waterways are required to be registered with the Canals and Rivers Trust.
<i>Representative Spaces</i>	Spaces which are those which are expected to reflect the condition of other spaces of similar type and service with similar corrosion prevention systems.
<i>Resorcinol</i>	An adhesive made from resorcinol resin and formaldehyde to which a powder hardener is added to form a strong water resistant glue.
<i>Reserve Buoyancy</i>	The buoyancy provided that by the volume of that part of the hull which is above water.
<i>Reverse Angle</i>	A secondary supporting angle fitted in a metal vessel to stiffen the top of plate floors.
<i>Reverse Curve</i>	A curve which changes direction.
<i>Reverse Sheer</i>	See <i>Sheer</i> .
<i>Rib Tickler</i>	A London River name for a barge's tiller.
<i>Ribband</i>	A long piece of strong scantling timber usually pine used to fair the moulds and frames when building or repairing a vessel.
<i>Ribband Lines</i>	The vertical and horizontal projections of the diagonal lines into the <i>Profile (q.v.)</i> and <i>Half Breadth (q.v.)</i> plans respectively. Rarely used.
<i>Ribs</i>	A name used for the vessel's frames or timbers by the press and yotties but not by naval architects or shipwrights.
<i>Rider Angle</i>	The rider angle or rider bar is an ordinary angle fitted either side of the vertical plate keelson and to one side of the intercostal girder over the top of the transverse floor plates.
<i>Righting Moment</i>	A measure of the tendency of a boat to return to upright when heeled. It is a product of the horizontal distance between the centres of gravity and buoyancy and the displacement of the boat. A measure of a vessel's transverse metacentric stability.
<i>Rigging Chocks</i>	Thick blocks of wood fastened outside the rails to take the chain plates for the shrouds.
<i>Rigol</i>	Pronounced <i>Wriggle</i> . See <i>Eyebrow</i> . (Probably obsolete but still in use in the author's apprenticeship days).
<i>Ripped Frame</i>	A bent frame partly sawn longitudinally to make it easier to bend. Not in common usage.
<i>Rise</i>	The vertical distance between two consecutive steps on a stairway or ladder. See <i>Stair</i> .
<i>Rise of Floor</i>	The vertical amount by which the flat bottom of a vessel rises transversely at the lower turn of bilge above the keel.

<i>Rise of Keel</i>	The vertical amount by which the forward end of the keel rise above the after end. It is usually measured as the difference between the forward and after draughts of the vessel at the perpendiculars.
<i>Riser or Rising</i>	Also called the riser timber or rising timber. A horizontal tiercery longitudinal non structural timber on the inside of the side frames or timbers of a wooden hull to form the ledge upon which the thwarts or the outer ends of the bearers under the cabin sole or a flat deck.
<i>Rising Line</i>	The line drawn through the points where the inner surface of the planks cuts the surface of the deadwood. It shows the height above the rabbet of the underside of the floors and fairs into the bearding line forward and aft and forms the edge of the back rabbet at each end of the hull. It is one of the five <i>Fundamental Lines</i> (q.v.) that define a vessel's shape.
<i>Rocker</i>	The upward curvature of the keel towards the bow and stern and is one of two conditions in the bottom of a planing boat that can lead to performance problems. It can lead to the boat porpoising. A similar effect will result from rounding the trailing bottom edge at the transom. In the extreme and/or at high speed, that can be dangerous. See <i>Hook</i> .
<i>Rocker Keel</i>	Keel with a longitudinally curved underside.
<i>Roller Stern</i>	A form of heavily rounded transom stern without a bulwark usually only fitted to Oil Rig Supply Vessels (ORSV's).
<i>Rolling Chocks</i>	Also <i>Anti-Rolling Chocks</i> . See <i>Bilge Keels</i> .
<i>Room and Space</i>	The distance from the moulding edge of one timber to the moulding edge of the next timber which is always equal to the breadth of two timbers and two to four inches or more. The room and space of all ships that have ports should be so disposed that the scantling of the timber on each side of the lower ports and the size of the ports fore and aft may be equal to the distance of two rooms and space. (Obsolete).
<i>Rot</i>	See <i>Decay</i> .
<i>Roughtree Rail</i>	An archaic (obsolete) name for the Cap Rail (q.v.) on the top of the bulwark round the edge of the main deck.
<i>Round Bilge</i>	The shape of the hull bottom where transforms gradually to hull sides through a curve.
<i>Rove</i>	A round saucer shaped copper washer with a central hole over which a copper boat nail may be clenched. Also <i>Roove</i> and, in America, <i>Burr</i> .
<i>Rowlocks</i>	In America called oarlocks. A device for holding an oar in place when rowing or steering. Strictly, a semi-circular crop in the gunwale or transom. The metal device described here is more correctly called a crutch. The majority of commercially available rowlocks (crutches) consist of a socket and a crutch or horn. The crutch is usually U-shaped or round. In the past various other systems of holding the oars in place have been used. See <i>Thole Pin</i> .

<i>Rub Rail</i>	An American name for the rubbing strake.
<i>Rubbing Strake</i>	A longitudinal piece fitted to the outside of the shell or skin and whose purpose is to prevent the vessel being damaged when she is laid alongside. In America it is called the rub rail. Also called belting.
<i>Rudder</i>	A foil separate from but attached to the rudder post or horn by the <i>Gudgeons</i> (q.v.) and <i>Pintles</i> (q.v.) which is used to steer the vessel. May take a number of different forms such as single or double plate rudder, Kort Nozzle rudder, Schilling Rudder, Pleuger Aktiv Rudder, Kitchen rudder, Simplex Rudder, Becker/Hatlapa rudder.
<i>Rudder Blade</i>	The rudder blade is the flat steel plate which directs the water driven by the propeller in such a direction as to turn the boat and is attached to the rudderstock.
<i>Rudder Horn</i>	An appendage extended below the hull of an frp boat to carry the rudder gudgeon.
<i>Rudder Post</i>	The upward extension of the after part of a cast stern frame and to which the transverse floors of the vessel's hull are attached and which supports the rudder gudgeons. In America, the name given to the <i>Rudder Stock</i> (q.v.).
<i>Rudder Stock</i>	The vertical bar of metal that forms the hinge upon which the rudder turns and which is operated by the vessel's steering gear.
<i>Ruffle</i>	The serrated iron ring fitted to the barrel of the anchor winch to which the pawl is applied to prevent the chain running out during breaks in weighing.
<i>Ruffle Hole</i>	A hole bored transversely across the keel just abaft the lower gripe scarp to take a rope to enable the vessel to be hauled (ruffled) up a beach.
<i>Run</i>	The length of the vessel's body under water lying abaft the after end of the <i>Parallel Mid Body</i> (q.v.).
<i>Runner</i>	A longitudinal primary strength member fitted under the beams in a cargo vessel in the same manner as a stringer sits inside the shell frames.
<i>Rust</i>	Electro-chemical decay of ferrous metals which may take one or more of five forms each of which require the presence of moisture and oxygen.
<i>Saddle Chock</i>	A transverse beam fitted on deck at the stern, directly over the transom of sailing barges and usually supporting fairleads for mooring warps.
<i>Sag</i>	The opposite of Hog (q.v.) when the mid body of the hull droops below her ends.
<i>Saloon</i>	The main cabin in a yacht usually containing the dining and general living space.

<i>Sampson Post</i>	Any post well attached to the vessel's structure to take heavy loads. On cargo vessels they are often rigged with a derrick. Frequently used to name a mooring bollard. .
<i>Sand Strakes</i>	See <i>Bottom Planking</i> .
<i>Scantlings</i>	These are the critical dimensions of any element vessel's structural members as pieces of wood and/or metal <i>i.e.</i> , as girders, stiffeners, plates <i>etc.</i> See <i>Dimensions</i> . For the skin and deck of the hull it would be the thickness (of the planks, fibreglass lay-up, hull plating, <i>etc.</i>). Also all quartering under five inches square which is termed scantling all above that size is called <i>Carling</i> .
<i>Scarph</i>	In America a scarf. A complex joint forming a means of joining two pieces of timber together lengthways. There are a number of scarph types with the name depending upon the method of locking used.
<i>Scarphing</i>	The Canadian name for letting of one piece of timber or plank into another with a lap in such a manner, that both may appear as one solid and even surface as keel pieces stem pieces and clamps. In the U.K. called <i>Scarphing</i> and in America <i>Scarfing</i> .
<i>Scroll Head</i>	Fitted on a ship where there is no carved or ornamental figure at the head but that the termination is formed and finished off by a <i>volute</i> or scroll turning outwards. A <i>Fiddle Head</i> (q.v.) signifies a similar kind of finish, but with the scroll turning aft or inwards.
<i>Scupper</i>	A hole cut through the cockpit, the lower edge of a bulwark or toe rail or a pipe running overboard from the outer edge of the deck to enable the deck to be freed of loose water. In the plural, a colloquial name for the outer edge of the deck. When in bulwark it is more correctly known as a <i>Freeing Port</i> (q.v.).
<i>Scuttle</i>	A flush hatch in the deck or elsewhere usually round and usually fitted with a watertight cover, lid or door and giving man access to a compartment. Also used as a name for a sidelight or port.
<i>Screen Bulkhead</i>	Also called a Division Bulkhead. See <i>Bulkhead</i> .
<i>Scrive Board</i>	Pronounced <i>screeve</i> . A large flat board upon which the vessel's body plan is laid down (drawn) full size and cut into the top surface with a <i>Rasing Knife</i> (q.v.) and to which the various frame moulds and other templates are made. (Obsolete).
<i>Sea Cock</i>	See <i>Skin Fitting</i> .
<i>Sea Rail</i>	An upstand fitted round the edges of all accommodation joinery flat surfaces to prevent items sliding off when the vessel is rolling in a seaway.
<i>Seam</i>	A joint between two structural members lying in the same plane and typically the term is used to described the welded or riveted connection between two plates in the longitudinal direction and adjoining strakes or the space between two strakes of deck or skin planking.

<i>Seat Locker</i>	A storage locker located under a cockpit seat.
<i>Secondary Supporting Structure</i>	Those items of structure which are not considered to be involved in the primary longitudinal or transverse bending of the hull girder such as bulkheads, clamps, frames, webs, shelves and stiffeners and those which, in frp built vessels, are attached by secondary bonds.
<i>Section Lines</i>	Curvilinear lines showing the shape of the transverse cross-sections of the hull at various points along her length. They appear as straight lines in the half breadth and profile (sheer draught). Also called displacement or frame cross stations.
<i>Self Draining Cockpit</i>	A cockpit that allows water to drain automatically from the cockpit to the outside of the vessel. Also called a self bailing cockpit.
<i>Selector Switch</i>	A heavy duty switch used to connect two batteries separately or together to the boat's electrical system. Also called a selector/deselector switch.
<i>Semi-displacement Hull</i>	See <i>Hull Form</i> .
<i>Setback</i>	The distance between the edge of a plate or plank to the centreline of a rivet or other fastening.
<i>Settee Berth</i>	A long cabin seat that converts into a bunk.
<i>Shaft Bracket</i>	This is a bracket usually made of cast aluminium, phosphor or silicon bronze supporting the outboard end of a propeller shaft by means of a (Cutless) bearing. It may come in one of two forms: -
<i>(1) P Bracket</i>	This type consists of a simple vertical hanging strut secured to the hull's centreline and is only found in single screw vessels.
<i>(2) V Bracket</i>	This type (illustrated in the Figure 398 below) is found in twin or multiple screw vessels having the propeller shaft fitted off the centreline and is sometimes referred to as a V bracket or, in British Admiralty practice, an A bracket. It usually consists of a barrel fitted with a bearing for the shaft connected to the hull by one or two streamlined arms. The arm angle is that between the axis of any arm and the base plane of the vessel when projected on to a transverse plane. The section angle is that between the mean line of any arm section normal to its axis at any selected point along the arm and a line lying in the plane of that section parallel to the centreplane or baseplane. The V angle is that between the axes of the two arms of a V shaped strut when projected on to a transverse plane. The forces that can act on either type of bracket are: -



Definitions of a V Bracket

- forces due to the weight of propeller, shaft and bracket.
- forces of inertia due to pitching, rolling and change of course.
- forces brought about by non uniform pressure on the propeller blades when the vessel is changing course.
- forces generated by seizing of the propeller shaft in the bracket bearing.
- forces created by a centrifugal force caused by a barycentre of weights in rotation not at the centre of the propeller shaft which will be at a maximum with the loss of a blade.
- vibrations determined by propeller functioning.

Both types are subject to pitting and to cavitation damage.

<i>Shaft Log</i>	A solid piece of tiercery main structure fitted closely to the bottom frames and bored to take the stern tube and/or propeller shaft.
<i>Sharpie</i>	An American term for a sharp bowed, flat bottomed, flat sided sailing skiffs over about 20 feet in length.
<i>Sheathing</i>	A secondary layer of metal or timber laid over a metal or wooden deck or hull surface.
<i>Shedder Plates</i>	Slanted plates fitted in dry cargo holds to prevent undesired pockets of cargo. The term is also applied to slanted plates fitted to improve the structural stability of corrugated bulkheads and other framing members.
<i>Sheer</i>	The sheer is the longitudinal curvature of the upper or main deck which is usually concave when viewed sideways on. If convex as is some small yachts it is called a <i>Reverse Sheer</i> .. The forward sheer is measured from the water line to the point where the upper deck at side line crosses the stem line and the after sheer is measured from the water line to the point where the upper deck at side line crosses the line of the

stern. In classed vessels it is defined by International law. In America the term is often used for the beam shelf or the Sheer Wale.

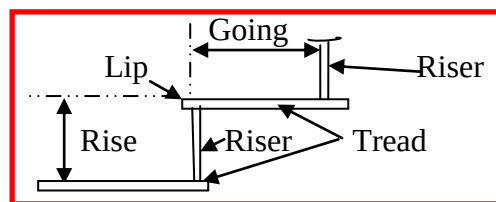
<i>Sheer Draught</i>	See <i>Profile</i> .
<i>Sheer Legs</i>	Also called Sheers or Jeers. A set of (usually) three long, strong timbers lashed together at the head to form a temporary crane to lift a heavy item such as an engine.
<i>Sheer Strake</i>	The sheer strake is the uppermost skin plank on the side of the vessel just below the covering board. If thicker than the topside planking it is called a sheer wale. In a metal boat it is the topmost strake of plating at the vessel's topside.
<i>Shelf</i>	The <i>Beam Shelf</i> . (q.v.)
<i>Shell</i>	The watertight side and bottom boundary of a vessel's hull and sometimes called the shell envelope.
<i>Shift of Butts</i>	A term applied to the disposition of the butts of the skin planking so that they may over launch each other without reducing the length and so as to gain the most strength. The spring of the butts should be such that: - • in two adjoining planks there must be at least three (preferably five) frame spaces between the butts. The classification societies require butts in adjacent planks to be at least 1.2 m (four feet) apart. The author prefers 1.80 m (six feet), • where two butts are in the same frame space there must be at least three planks between the planks containing the butts. • The three or more butts over adjoining strakes should not lie in a straight line.
<i>Shifting</i>	The act of setting off the length of the planks so that the butts may over launch each other, in order to make a good shift. Replacing old stuff with new is also called <i>shifting</i> .
<i>Shiplap</i>	In America the name for clinker planking. In the U.K. the name for a heavy dovetail joint at the corner of a hatch coaming.
<i>Shipworm</i>	A misnomer for one of the many marine wood boring molluscs of the genera <i>Teredos</i> . See <i>Worm Shoe</i> .
<i>Shoe</i>	A steel plate or bar structure built round the keel of a wooden boat to take the wear when beaching or grounding. Such a keel is said to be shod in steel.
<i>Shoe Plate</i>	The plate wrapped round and under the heel of the stem of a metal vessel and which forms the forward end of the keel strake.
<i>Sholes</i>	Pieces of fir plank placed under the soles of the standards or under the heels of the shores in docks or on slips where there are no ground ways, to enable them to sustain the weight required without sinking. Also called <i>Caps</i> .

<i>Shores</i>	Pieces of timber fixed under the bilges or against the sides and bottom of the ship to support her whilst she is ashore.
<i>Shoulder</i>	The area of the hull where the parallel mid body curves into the entrance.
<i>Shoulder Plate</i>	The extra thick side plating at the after end of the entrance of a River Lea lighter or barge.
<i>Shroud Plates</i>	Another name for the <i>Chain Plates</i> (q.v.).
<i>Side Scuttle</i>	Also called a sidelight or (incorrectly) a porthole (2). It means an ISO standardised type of an opening hinged or non opening round ship's window with or without a deadlight (ISO 6345:1990).
<i>Sidelight</i>	Another name for a side scuttle. Also the port and starboard navigation lights. Often incorrectly called a porthole.
<i>Siding</i>	The dimension of the timber lying parallel to the moulded surface of the hull.
<i>Sill</i>	The lower edge of any side opening through the hull or accommodation block.
<i>Single Bottom Structure</i>	The shell plating together with the floors, stiffeners and girders below the upper turn of bilge where no inner or double bottom is fitted. Also called an open floor structure.
<i>Sirmarks</i>	The different places marked upon the moulds where the respective bevellings are to be applied.
<i>Sister</i>	A member laid alongside and original member either to strengthen the original or to act as a repair.
<i>Sistered Frames</i>	Frames built of pairs of futtocks laid side by side and cross bolted together with the butts between the various futtocks staggered.
<i>Skeg</i>	The bottom section of a cast stern frame (also called a Solepiece) or an angle or other steel structure extending beyond the after end of the keel or the heel of the stern post. On some vessels such as tugs and trawlers the name is given to a fin structure usually containing the stern tube below the afterbody.
<i>Skin</i>	A term used to describe the hull shell irrespective of the material of its construction. In sandwich construction there is an inner and an outer skin.
<i>Skin Fitting</i>	A valve or other fitting attached to the vessel's plating or planking to facilitate the overboard discharge of liquids. In America called a Through or Thru Hull.
<i>Skylight</i>	A small box like superstructure with or without glazing fitted above the main deck with topside openings to serve as a ventilator for the engine room or quarters etc.
<i>Slab Sided</i>	See <i>Wall Sided</i>

<i>Slack</i>	Not fastened, loose.
<i>Slacken, to (Verb)</i>	To loosen.
<i>Sleepers</i>	Horizontal secondary supporting members which strengthen bulkheads and similar vertical surfaces. In metal vessels they are called girders.
<i>Smoke Stack</i>	The American name for the <i>Funnel</i> .
<i>Snipe</i>	A simple butt joint where the end of a deck plank is cut at an angle to allow it to lay against the inner edge of a margin strake or covering board. A plank so cut is said to be sniped.
<i>Snying</i>	A term applied to planks when their edges round or curve upwards. The great sny occasioned in full bows or buttocks is only to be prevented by introducing stealers. Planks that curve downward are said to <i>Hang</i> .
<i>Solid Rail</i>	A solid timber several cm high fitted to the edge of the deck, sloped on the outside by flare or tumblehome to suit the hull with an outward slope on the inside and drifted through the covering board into the beam shelf and fitted with a cap rail. Also called a Deck or Log Rail See Toe Rail.
<i>Sole</i>	The cabin or cockpit floor.
<i>Solepiece</i>	See <i>Skeg</i> .
<i>Space(s)</i>	Separate compartments within the vessel including the cabins, engine room, cargo holds and any tanks <i>etc.</i>
<i>Spacing</i>	See <i>Frame Spacing</i> .
<i>Span</i>	The unsupported breadth of a shell plate panel between the supporting frames or stiffeners.
<i>Spar Lining</i>	See <i>Lining</i> .
<i>Speed-Length Ratio</i>	A Formula used to compare potential speeds of displacement or semi-displacement hulls. Not used for planing hulls. The Waterline Length is thus one of the factors used to determine the speed potential of a displacement boat and the longer the length, the greater the speed potential. The overall length is irrelevant as the overhangs forward and aft do not increase hull speed potential.
<i>Spiles</i>	Small wooden pins which are driven into nail holes to prevent leaking.
<i>Spiling (1)</i>	The curved edge of a strake or plank in the hull of a vessel.
<i>Spiling (2) (Verb)</i>	A shipwright's method of scribing equal distances from an uneven or curved surface by means of a light rod or scribing block instead of by compasses.
<i>Spilings</i>	The dimensions taken from a straight line, a mould's edge or rule staff to any given line or edge.
<i>Spilly Place</i>	An area in a piece of wrought iron where silicious slag has collected.

<i>Spirket</i>	In a wooden ship with built frames, the empty space between the frame timbers. (Obsolete).
<i>Spirketting Bar</i>	In metal ships, an ordinary angle fitted at the outer edge of the 'tween deck inside the heels of the shell frames.
<i>Spirket Block</i>	Sometimes called a spirket chock. A filling chock fitted between the floor futtocks and between the top of the hog and the underside of the keelson. Usually dovetailed into the floor futtocks. (Obsolete).
<i>Spirketting Plate</i>	A narrow upright plate fitted in metal ships between the back of the spirketting bar and the inside edge of the web of any transverse shell frame in way and riveted to the spirketting bar and lugged to the frame web.
<i>Spirketting Timber</i>	A primary supporting timber fitting on top of the decking and inside the heel of the frames or timbers. (Rare).
<i>Splashback</i>	An upstand fitted at the back of all accommodation joinery flat surfaces to prevent items sliding off back between the frames and into the bilge when the vessel is rolling in a seaway.
<i>Splashboard</i>	The American name for a <i>Breakwater</i> (q.v.).
<i>Spline (1)</i>	A thin tapered strip of wood hammered and glued into carvel plank seams either as an original caulking method or into seams which have become overlarge due to excessive caulking.
<i>Spline (2)</i>	A thin square long strip of wood used for fairing the lines of the vessel either of a drawing board by the designer or on the scribe board when laying off the lines full size.
<i>Sponson</i>	A sideways extension of the upper deck usually amidships to cover and strengthen such items as paddle wheels. Also a projection or addition to the side or bottom of the boat to help stabilize or provide lift.
<i>Spoon Bow</i>	A forward overhang with rounded V sections.
<i>Spray Knocker</i>	A colloquial American term for a <i>Lifting Chine</i> (q.v.).
<i>Spray Rails</i>	Spray rails are triangularly shaped secondary fairing rails with their lower faces horizontal that run along the bottom of the vessel up to the bow. Other, smaller sets of spray rails may be fitted closer towards the centreline. Their purpose is to deflect the water spray at high speeds. They provide little or no dynamic lift and are effective only on boats capable of planing (speed-length ratio of three and above). In slower boats, they have no other effect than to increase the wetted area and thus slow the boat down. On wooden boats they are attached to the hull by means of screws into the bottom planking but on frp hulls they are moulded into the hull surface. In America they are called strakes without any qualification.
<i>Spread</i>	The distance between parallel lines of rivets or other fastenings.

<i>Spring (of the keel)</i>	Wooden boats are heavy at the ends where there is the least supporting buoyancy as a result of which, when put afloat, they tend to hog. To offset this, when the keel is laid it is usually given an initial sag or spring of about 1½" to 2" per hundred feet of waterline length.
<i>Sprittie</i>	A spritsail rigged Thames sailing barge.
<i>Sprung</i>	A term indicating that a plank is so strained in the working as to crack or fly open and so as to be nearly broken off.
<i>Sprung Frame</i>	A metal shell frame laid over the land of a shell seam without any joggling is said to be sprung. Commonly found on Dutch built barges.
<i>Spurling Pipe</i>	A tube fitted under the fore'sle deck to carry the anchor chain or cable down from under the windlass or capstan to the top of the chain locker. Also called a <i>Navel Pipe</i> .
<i>Square Body Frames</i>	The midship frames (or timbers) set at right angles to the keel.
<i>Squat</i>	The condition of sailing when the stern sinks deeper into the water.
<i>Stability</i>	The naval architecture of the reason why and the ability of a vessel's return to the upright when heeled.
<i>Stackie</i>	A barge designed to carry hay or straw piled up high above her hatches. Stackie barges were generally built with little sheer and a feature was the wide deck between rail and hatch coaming designed to accommodate a standard bale.
<i>Stain</i>	Discolouration in wood due to the action of micro-organisms, metal or chemicals.
<i>Stair</i>	A stair or companion way to gain access not given by a ladder to another deck within a vessel. The transverse distance between the styles or side pieces of the stair or ladder is also called the tread. See the sketch below.



Definitions of a Stair

<i>Stanchions</i>	A fixed or portable metal or wooden vertical post designed to support another item such as the life rail or the cap rail. Also sometimes called a <i>Pillar</i> (q.v.).
<i>Standard Knees</i>	Heavy vertical knees fitted inside the bulwark and terminating under the cap or main rail usually fitted in pairs in way of the standing rigging to support the bulwark and resist transverse strains. Also similar knees supporting the bitts.

<i>Standing Foot Wale</i>	A primary supporting timber fitted in wooden barges on top of the floors and inside the heel of the side timbers. Sometimes (possibly incorrectly) called the spirketting timber.
<i>Starboard</i>	The starboard side is the right hand side of the vessel when facing forward.
<i>Station</i>	One of a series of equally spaced transverse cross-section slices of the hull as shown in the lines drawing. There may or may not be frames or bulkheads at all or any of the stations. Also referred to as sections.
<i>Stave, to (Verb)</i>	To make a hole in a boat by damage and bursting a plank inward. \The past tense and participle is stove.
<i>Staves</i>	Bottom planking in wooden hard chine boats when laid athwartships are called staves. Staves amidships are called cross staves or boards and those closing the forward end, if laid parallel to the keel, are called fore and aft staves and, if laid transversely and slowly widening at the chine are called fan staves. If laid transversely but laying aft toward the chine the planking is said to be laid herringbone fashion.
<i>Stay</i>	Stiffeners to the steel bulwarks and hatch coamings are called stays.
<i>Stealer</i>	In wooden vessels a strake introduced at her ends as a single continuation of two tapering strakes.
<i>Stealer Plate</i>	A plate performing the same function in a metal boat as a <i>Stealer</i> (q.v.) in a wooden one and fitted at the ends of the vessel where two strakes of plating are run into one the reducing the width of the strakes as the vessel's girth reduces to reduce weight and the amount of welding or riveting
<i>Steam Bending</i>	The process of forming a curved member by steaming or boiling the wood to make it flexible and to assist in bending it to a former.
<i>Steering Gear</i>	Machinery used to control the vessel's movements by altering the angle of the rudder.
<i>Steering Gear Flat</i>	Space or deck where the steering gear is fitted in the vessel.
<i>Stem</i>	The stem is the forward most vertical primary main member forming the leading edge of the hull. It was mostly a single piece of timber but could be built up with separate pieces called the cutwater, lacing piece, gammon piece and filling chocks to form a built stem. In a steel vessel the stem may be manufactured from a solid bar or from a rolled plate called, respectively, a bar stem and a plate stem. If the plate stem is rolled to a radius, it is said to be a soft nosed stem. Sometimes, incorrectly, called the prow by the press or yotties. See <i>Prow</i> .
<i>Stemhead Fitting</i>	A metal fitting to take the lower end of the forestay or as a resting place for the anchor at the head (top) of the stem. Also called a <i>Gammon Fitting</i> .

<i>Stemson</i>	A curved timber set above the deadwood and behind the apron to support the scarphs. A similar timber set inside the stern post is called the sternson.
<i>Stem Band</i>	A half round metal (either steel or bronze) screwed to the cutwater of the stem and round the gripe for protection purposes.
<i>Step</i>	The abrupt discontinuity in the profile of the bottom of a planing craft, designed to diminish resistance, to lessen the suction effects and to improve control of the longitudinal attitude.
<i>Step Angle</i>	The angle projected upon the designed waterline between the lower corner of a step of a planing craft and the centreline.
<i>Steppings</i>	The rabbets sunk in the deadwood at the bearding line wherein the heels of the timbers forward and aft rest or step.
<i>Stern</i>	The after end of the vessel. It may take many forms depending upon the vessel's design conditions. It is frequently pronounced <i>starn</i> .
<i>Stern Frame</i>	The name in metal vessels for the <i>Stern Post</i> (q.v.).
<i>Stern Post</i>	The stern post is the aftermost vertical primary main member forming the trailing edge of the hull below water. In a metal vessel it is usually a casting and is called the stern frame. It often combines the rudder post.
<i>Stern Rail</i>	An enclosed safety rail around the stern of a vessel more usually called the <i>Taffrail</i> (q.v.).
<i>Stern Gland</i>	Watertight gland at the inner end of the stern tube.
<i>Stern Sheets</i>	The are behind the aftermost thwart just inside the transom of a rowing boat or dinghy.
<i>Stern Thruster</i>	The same as a <i>Bow Thruster</i> (q.v.) but at the after end of the vessel.,
<i>Stern Tube</i>	A heavy steel or bronze tube containing the propeller shaft's after bearing and built into the after structure of the vessel to allow the tail end shaft to pass through the shell. It is made watertight at the inner end by means of a packed <i>Stern Gland</i> (q.v.).
<i>Sternson</i>	See <i>Stemson</i> .
<i>Stiffeners</i>	A collective term for the vertical secondary supporting members that are fitted to strengthen bulkheads and similar surfaces. The top of the stiffener is called its head and the bottom its heel.
<i>Stiffener Spacing</i>	See <i>Frame Spacing</i> .
<i>Stitch-n-Glue</i>	A simplified construction method using sheet plywood which eliminates the use of stems and chines thus avoiding the fairing required in conventional plywood construction.
<i>Stomach Piece</i>	Another name for the <i>Apron</i> (q.v.).
<i>Stool</i>	A structure supporting such an item as a deck bollard. In big ships stools (often in the form of a void space tank) are built to spread the local weight of the transverse bulkheads.

<i>Stopping</i>	Putty or similar material used to close off a seam after caulking it.
<i>Stopwater</i> ¹	A softwood plug filling a hole drilled across a lap, the table of a keel or gripe scarph or butt joint in the backbone structure or elsewhere designed to swell and to stop water percolating up the fay to prevent seepage of water into the hull. Any contrivance to accomplish this purpose.
<i>Storm Boards</i>	Sometimes called weather boards. Loose pieces of timber fitted into slots at the sides of deck openings in deck house bulkheads to prevent sea water on deck going below.
<i>Strake</i>	A longitudinal course, row or line of wood or plating in the deck, skin or other plating or planking extending from bow to stern. On a bulkhead the strakes run transversely and the lowest one is usually thicker than the others as it is subject to heavy corrosion.
<i>Strength Deck</i>	Normally the uppermost continuous deck but, after special considerations, the classification societies may designate another deck as the strength deck.
<i>Stringer</i>	A primary supporting longitudinal member inside the timbers or frames and sometimes called a bilge stringer. Also a longitudinal primary supporting member fitted to the inside of the side plate of a canal narrowboat and toe welded flange downward.
<i>Stringer Angle</i>	In a metal boat the angle that connects the outer edge of the deck stringer plate to the top edge of the sheer strake.
<i>Stringer Plate</i>	The outermost strake of deck plating on a metal vessel. Sometimes (incorrectly) called the margin strake.
<i>Strip Planking</i>	A planking method that uses strips of wood installed longitudinally and edge glued and nailed together. The planks are usually made with bead and cove edges to eliminate fitting the plank edges.
<i>Strongback</i>	An American name for the <i>Horn Timber</i> (q.v.). Also a longitudinal timber along the vessel's centreline over a hatch to take the inner ends of transversely laid hatch cover boards.
<i>Strum Box</i>	A strainer constructed of steel plate with numerous hole perforations fitted over the suction end of the bilge pumping system to keep out rubbish from the pump.
<i>Studwork</i>	A method of building a deck house with a softwood frame called a <i>Carcase</i> with an inner and outer plywood covering, the outer cover being called the <i>Gabling</i> (q.v.).
<i>Stuffing Box</i>	Traditional type of seal at forward end of the propeller tailshaft bearing. See <i>Stern Tube</i> and <i>Stern Gland</i> . It is packed with a combination of special rope packing and grease to lubricate the bearing and prevent water entering the hull.

¹ It is very difficult to bore the hole for a stopwater as the threaded point of the bit tends to follow the line of the scarph fay with the result that the entry to the hole is far from clean cut. To avoid this, the marine surveyor should tack a thin piece of wood over the point where the hole is to be bored and then drill through that into and across the faying surface. A trick the author learned as an apprentice shipwright.

<i>Stumpie</i>	A barge without a topmast. A tops'l barge under way without the tops'l set is spoken of as being stumpie or stumpy rigged.
<i>Sugar Scoop Stern</i>	An boat usually of frp construction with a transom stern moulded to include a swim platform is said to have such.
<i>Superstructure</i>	The superstructure is any building above the uppermost continuous deck extending for at least 92% of the vessel's breadth.
<i>Supporting Structure</i>	Structure other than shell, deck or bulkhead plating, wood or frp matrix. May be subdivided into <i>Primary</i> (q.v.), <i>Secondary</i> (q.v.), Tiercery or Quartenary supporting structure.
<i>Swedish Galvanizing</i>	Similar to <i>Chinese Galvanizing</i> (q.v.) but using tar instead of linseed oil.
<i>Sweep</i>	An old shipwright's term for an arc on the body plan. Obsolete.
<i>Swim</i>	The void space at each end of a London River swim ended lighter or barge. The plate forming the underside of such a compartment is called the swim plate.
<i>Swim Ended</i>	A London River lighter or barge with a sloping flat plate at each end forming the bottom of the swim is said to be swim ended.
<i>Swimmie</i>	A barge with square overhung bow like that of the London River lighter. Occasionally called Muffies (perhaps from hermaphrodite).
<i>Swim Plate</i>	See <i>Swim</i> .
<i>Swim Platform</i>	Also Stern or Bathing Platform. A light structure attached to the after end of the vessel, reached from the deck by means of a ladder and fitted to enable people to reboard the vessel after a swim. On frp boats sometimes moulded into the transom when the boat is said tyo have a Sugar Scoop stern. See Glossary 6.
<i>Syphering</i>	A mode of joining by overlapping the edge of one plank upon another with a bevelling edge instead of rabbet in such a manner that both planks shall make a plain surface, though not a flat or square joint.
<i>Tabernacle</i>	See <i>Mast Case</i> or <i>Box</i> and <i>Lutchet</i> .
<i>Table</i>	The horizontal or near horizontal faying surface of a scarph. If the scarph is cut vertically (rare) the surface is called, simply, the face.
<i>Tabloid Cruiser</i>	An American name for a small cruiser.
<i>Tailing</i>	The reduction in siding of the after edge of the stern post designed to give a less blunt end to the waterlines.
<i>Taffrail</i>	The section of the deck side rail that extends round the stern.
<i>Tank Bulkhead</i>	A boundary bulkhead for a tank designed to carry liquid cargo, ballast or bunkers.

<i>Tank Top</i>	Some of the larger, coastal vessels may be fitted with a double bottom and the plate forming the top of the tank is a secondary main structure called the tank top or inner bottom.
<i>Template</i>	A light wooden structure defining the shape of a plate, frame or similar item onto which such marks as rivet holes and jerrolds are placed for transfer to the plate material. See <i>Mould</i> .
<i>Texas Bar</i>	An American name for a <i>Towing Arch</i> (q.v.).
<i>Thames Measurement</i>	An old but still valid method of tonnage measurement used for tax rating where $\text{Tonnage} = (\text{Length of Hull} - \text{Breadth})\text{Breadth}^2/188 \quad \text{tons}$ This uses Imperial dimensions and, although given in tons, is NOT a measurement of the vessel's weight but in an approximation to the vessel's internal carrying capacity. It has no statutory recognition or significance and is largely obsolete.
<i>Thwart</i>	A seat running across an open boat.
<i>Thick Stuff</i>	Bottom planking between the top of the wrunghead wale and the underside of the bilge wale. (Obsolete). See <i>Diminishing Stuff</i> . Also a name for sided timber exceeding four inches but not being more than twelve inches, in thickness.
<i>Thole Pin</i>	One of a pair of wooden or metal pins set vertically in the gunwale of a boat that serve as rowlocks.
<i>Throat</i>	The inside of knee timber at the middle or turn of the arms. Also the midship part of the floor timbers and transoms.
<i>Through Bolt</i>	A bolt driven through a wooden King Post, Quarter or Samson Post to form a secure lodgement for a line made fast round the post. Also a deck fastening that penetrates the deck and is fastened below with a nut and washer.
<i>Through Hull</i>	An inaccurate American term for a <i>Skin Fitting</i> (q.v.). Also Thru Hull.
<i>Thwart</i>	A transverse piece of timber in a dinghy or lifeboat designed to form a seat for the occupants.
<i>Thwartships</i>	Across the ship at right angles to the centreline of the vessel or from one side to the other. Right athwart signifies square or at right angles with the keel.
<i>Thwart Knee</i>	Vertical knees fitted above the thwart and terminating under the gunwale.
<i>Tie Rod</i>	A steel rod driven through the beam shelf and running alongside a carling beam and extending through the carling being clenched at both ends to tie the side deck together.

<i>Tiller</i>	In vessels that are not steered by a wheel, a tiller is a lever attached to the top of the rudder to enable the helmsman to turn it.
<i>Timber (1)</i>	Every side frame if grown or steam bent is called a timber. The name is never applied to so-called sawn frames which are always referred to as frames. A name generally given to the pieces of timber which compose the frame of a ship such as floor timbers, futtock timbers and top timbers as also the stem or head timbers and the stern timbers. Sometimes those carved ornaments upon the munions in the stead of pilasters are called stern timbers.
<i>Timber (2)</i>	In Britain unsawn tree trunks are called lumber and are called timber only when sawn to given dimensions. The term lumber is, in any case, more frequently used in America where all wood, sawn or unsawn, is called lumber. All small cut timber is called wood.
<i>Timbers</i>	A name generally given to the pieces of timber which compose the frame of a ship such as floor timbers, futtock timbers and top timbers as also the stem or head timbers and the stern timbers. Sometimes those carved ornamental pieces upon the munions of stern windows in the stead of pilasters are called stern timbers.
<i>Timberhead</i>	The top of the uppermost frame futtock extending above the covering board to form a stiffener to the bulwark and to which the berthing is attached. The cap rail or main rail is attached to its tops by means of a mortise and tenon joint. It may be a piece of timber separate from the frame.
<i>Tingle</i>	A piece of light metal usually copper nailed over a defect in a small vessel's planking as a temporary repair to prevent leaking and/or further deterioration. See <i>Welt</i> .
<i>Toe Rail</i>	A light small dimensioned piece of timber or angle fitted to the top of the deck round its outer edge to form a decoration or a foot grip when the vessel is heeled. It is often slotted, to allow drainage and the attachment of blocks. On frp boats it is moulded into the deck moulding. See <i>Log Rail</i> .
<i>Toe Welded</i>	An angle attached to a piece of structure by welding the end of the web thereto is said to be toe welded or inverted.
<i>Tonnage</i>	Gross and Net Tonnages are 'Measurement' Tonnages and are measures of volume, NOT weight, and their definitions are laid down by statute. They are Registered with the appropriate authority and are the basis upon which light and harbour dues are charged. See <i>Thames Tonnage</i> .
<i>Topgallant</i>	Pronounced <i>t'gall'nt</i> and often applied to anything higher than usual.
<i>Topgallant Bulwark</i>	A light bulwark above the main rail.
<i>Topgallant Fo'c'sle</i>	A small locker built above the fo'c'sle deck to house the inner end of a spike bowsprit on an iron or steel sailing ship.
<i>Topgallant Rail</i>	A light scantling rail forming the top of a topgallant bulwark.

<i>Top Hamper</i>	Any unnecessary weight aloft either on the topside of the ship or about its tops and rigging.
<i>Topsides</i>	The side area of the vessel between the upper turn of bilge and the top of the shear strake. Also the sides of a vessel between the waterline and the deck. The word is often used to refer to onto or above the deck.
<i>Topside Wing Ballast Tanks</i>	Water ballast tanks found in the larger bulk carriers and which normally run the full length of the cargo spaces and occupy the upper corners of the cargo holds under the deck head each side.
<i>Top Timber</i>	The uppermost of the futtocks in a built frame and which stops just below the underside of the covering board except in sistered frames when one futtock is extended through the deck to form the timberhead.
<i>Towing Arch or Rail</i>	Often called a towing bar and is a strong angle iron or T bar often capped with hard wood and fitted from side to side across the after deck of a tug to prevent the tow line snagging the engine room fiddley casing skylights and to prevent injury to the crew.
<i>Trail Boards</i>	A pair of curved, carved and painted boards one on each bow stretching aft from the figurehead and often carrying the vessel's name.
<i>Trailer Harpin</i>	See <i>Harpin</i> .
<i>Trampoline</i>	The fabric support that serves for seating between the hulls of a catamaran or a trimaran.
<i>Transom(1)</i>	A flat area forming the square after end of a vessel. It may be rounded and slope forward or aft depending upon the vessel's design.
<i>Transom (2)</i>	A horizontal separating piece in a window.
<i>Transom Stern</i>	The stern shape where the hull ends in a transom.
<i>Transom Timber</i>	A heavy transverse timber fitted across the top of the stern frame to carry the weight of the Transom.
<i>Tread</i>	See <i>Stair</i> .
<i>Tread of the Keel</i>	The whole length of the keel upon a straight line.
<i>Treenail</i>	Pronounced <i>trennel</i> or <i>trunnel</i> . A wooden peg used to secure a vessel's planking to her frames or timbers.
<i>Trim</i>	The way a vessel sits in the water and her fore and aft balance.
<i>Trim Tab(s)</i>	A tab device affixed to the lower units of some outboard motors that compensates for the torque produced by the propeller, sometimes made of magnesium to act as a sacrificial anode to help prevent corrosion. Also a fixed or hinged plate(s) attached to the transom of a motor boat to keep the stern from burying when she is run at high speed.
<i>Trunk</i>	An American term for the <i>Coachroof</i> (q.v.).

<i>Tube</i>	A tube or pipe is a long, circular, hollow steel member often used as a <i>Pillar (q.v.)</i> . A fine verbal distinction is made between a pipe and a tube which is based on the manner the size of the item is identified. The three important dimensions of any tubular product are the outside diameter (OD), the inside diameter (ID) and the wall thickness (t_w). The unit is called a tube if its size is identified by the actual measured outside of its diameter (OD) and a pipe if its size is identified by a nominal dimension called the iron pipe size or IPS with reference to a wall thickness schedule designation. In pipe over 12 inches OD the nominal pipe size and the actual outside diameter are the same.
<i>Tuck</i>	The point on the hull where the stern frame enters it. Also applied to the joint between the hull bottom and the top of a fin keel where it is more correctly called the garboard tuck or seam.
<i>Tuck Plate</i>	Another name for the <i>Oxter Plate (q.v.)</i> .
<i>Tumble Home</i>	The amount that the sheer strake or topboard slopes inward at the deck edge. Sometimes (rarely) called falling home.
<i>Turn of the Bilge</i>	The <i>Lower Turn</i> is where the flat bottom starts to turn up to form the Bilge Sweep (<i>q.v.</i>) and the <i>Upper Turn</i> is where the flat sides start to turn in to meet it.
<i>Turning Frame</i>	In a riveted vessels, the shell frames are flange laid with open bevels so that the flanges toe toward the midship section. At the midship section the flanges change from toeing in one direction to toeing in the other. The frames at which this occurs are called the turning frames. Turning frames are often not found in Dutch built barges.
<i>Turned Nail</i>	A boat nail driven through the timber with the inboard end turned on a bucking iron and driven back into the timber as an alternative to clenching. American usage calls a turned nail clenched and a clenched nail riveted.
<i>Tupperware Boat</i>	A scornful name for boats built of fibre reinforced plastic.
<i>'Tween Deck</i>	See <i>Deck</i> .
<i>Twin Keels</i>	Describes a boat fitted with twin side keels but no central backbone keel.
<i>Underside of Keel Line (USK)</i>	A line drawn along the underside of the keel, the keel plate or bar keel and extended to the forward and after perpendiculars.
<i>UTS</i>	Either ultimate tensile strength or ultrasonic thickness survey depending on context.
<i>UV</i>	Ultra-violet.
<i>Ultrasonic Testing</i>	A non destructive test using ultra-sound applied to iron and steel vessels for the purpose of measuring thickness and locating internal flaws or structural discontinuities.
<i>Uxter Plate</i>	See <i>Oxter Plate</i> . Sometimes, on narrowboats, called the Counter Plate.

<i>V Bottom</i>	A hull with the bottom transverse section in the shape of a V.
<i>V Bracket</i>	See <i>Shaft Bracket</i> .
<i>Vented Loop</i>	Inverted U shaped pipe with a vent at the top, used as a section in toilet discharge lines to prevent back siphoning.
<i>Ventilator</i>	Construction of various types designed to lead air below decks. May have a cowl, which can be angled into or away from the wind and may be constructed with baffles so that water is not allowed below. See <i>Dorado Box</i> .
<i>Van Dieren Stern</i>	A form of stern with straight buttock lines cutting a vertical transom and after side plates having the same shape as the deck plan and often with hollow transverse sections. Usually found only on tugs and small coasting vessels.
<i>Void Space</i>	An enclosed empty space within a vessel – usually a tank or cofferdam.
<i>Vinylester</i>	A modified epoxy resin in an ester linking system. It has high physical properties and outstanding corrosion resistance. To current experience and knowledge, there has never been an osmotic blister in a boat built with vinylester resin.
<i>Waist</i>	The area of the main deck between the drift or break of the fo’c’sle and that of the poop.
<i>Waist Strakes</i>	An American term for the <i>Berthing</i> (q.v.).
<i>Wale</i>	An extra thick piece of skin planking. In a wooden vessel there may be a number of wales such as (starting from the keel): - i. The garboard wale. (q.v.).(Rare and probably obsolete) ii. The wrunghead wale. (q.v.). (Obsolete) iii. The bilge wale. (q.v.). iv. The main wale(s) (q.v.). v. The gunwale (q.v.) vi. The sheer wale. (q.v.).
<i>Wall Sided</i>	A term applied to the topsides of a ship when the main breadth is continued very low down and very high up for the whole of the vessel’s parallel mid body so that the topsides appear flat, straight and upright like a wall. Also <i>Slab Sided</i> .
<i>Wash Boards</i>	See <i>Storm Boards</i> . Also an American name for the <i>Covering Board</i> (q.v.).
<i>Wash Bulkhead</i>	Perforated or partial bulkhead within a tank and fitted to reduce the free surface effect.
<i>Wash Port</i>	See <i>Freeing Port</i> .

<i>Water Lines</i>	Lines showing the longitudinal curvature of the vessel at different draughts and which appear as curves in the half breadth plan and as straight lines in the profile and body plans. Sometimes called Water Planes.
<i>Watertight Bulkhead</i>	Collective term for the transverse and longitudinal bulkheads required for the subdivision of the hull into watertight compartments.
<i>Waterway</i>	A slightly wider piece of deck planking laid immediately inside the covering board and the heels of the timber heads.
<i>Weather Boards</i>	See <i>Storm Boards</i> .
<i>Weather Deck</i>	The uppermost continuous deck and the one exposed to the weather.
<i>Web Frame</i>	Also called a Deep Frame and consisting of a transverse plate frame set at right angles to the shell and secured thereto by angles and usually fitted with a face plate also secured to the free edge of the plate by angles.
<i>Weepage</i>	A process of very slow leakage, very often involving the capillary effect in addition to just water pressure from outside the hull. Weepage is not referred to as leakage because the rate is so slow that the water evaporates nearly as fast as it enters the interior of the vessel.
<i>Welt</i>	An American term for a strip of wood or metal fastened over a flush joint or seam to prevent leakage or for strengthening purposes. In the United Kingdom called a seam batten. See <i>Tingle</i> .
<i>Wetted Surface</i>	The area of that part of the hull which is in contact with the sea when she is upright in calm, still water.
<i>Whaleback</i>	A whaleback was a type of cargo ship of unique design with a hull that continuously curved above the waterline from vertical to horizontal. When fully loaded, only the rounded portion of the hull could be seen above the waterline. With sides curved in towards the ends, it had a spoon bow and a very convex upper deck. It was formerly used on the Great Lakes of Canada and the United States, notably for carrying grain or ore. The term has also been applied to a type of high speed launch first designed for the Royal Air Force in World War II and to certain smaller rescue and research vessels especially in Europe that, like the Great Lakes vessels, have hulls that curve over to meet the deck. The designation in this case comes not from the curve along the gunwale, but from the fore and aft arch in the deck. Another application of the term is to a sheltered portion of a heavily rounded structure fitted usually over the foredeck also occasionally over the after deck of deep sea fishing vessels. It is designed, in part, so that water taken over the bow is more easily shed over the sides. The feature has been incorporated into some pleasure craft based on the hull design of older whaling boats, in which it often called a whaleback deck. Some of the early double diagonal wooden RNLI lifeboats had whaleback decks. Commonly seen also in the whaleback fo'c'sle decks of fishing vessels.

<i>Wheelhouse</i>	Space in the superstructure dedicated to the navigation of the vessel.
<i>Whelp</i>	Raised strips in the barrel of a windlass or capstan or on the after end of a boom.
<i>Whipstaff</i>	A vertical shaft, hinged at the heel and fitted so as to turn the tiller and so move the rudder. (Obsolete).
<i>Whisker Harpin</i>	See <i>Harpin</i> .
<i>Whole Moulding</i>	A traditional shipwright's method of lofting a vessel's body plan using only the line of the keel rabbet, the rising line, the sheer line and the deck at side line in conjunction with a breadth mould and a hollow mould from the midship or dead flat section and a rising square. See <i>Geometrical Lines</i> .
<i>Wicking</i>	In America, a caulking material such as cotton or oakum wrapped around a fastening to protect it from leakage. In Britain called a grommet.
<i>Winch</i>	Mechanical device for hauling in a line. A device with a revolving drum, around which a line may be turned in order to provide mechanical advantage in hoisting or hauling.
<i>Wind and Water Strakes</i>	The strakes of a vessel's side planking or plating between the light and load waterlines. Also (incorrectly) called the <i>Boot Topping</i> (q.v.).
<i>Winding</i>	When two separate items lie parallel to each other they are said to be in winding.
<i>Windlass</i>	See <i>Anchor Windlass</i> and <i>Capstan</i> .
<i>Window</i>	Means a ship's window, being any window, regardless of shape, suitable for installation aboard ships (ISO 6345:1990).
<i>Windward</i>	Pronounced <i>Wind'ard</i> . The direction from which the wind/weather comes. Upwind.
<i>Wing Girder</i>	An alternative (rare) name for the Intercostal Side Girder.
<i>Wing Transom</i>	A horizontal timber attached to the stern post forming the shape of a vessel's stern.
<i>Wishbone Frame</i>	A pair of frames at the stern of a vessel inside the transom and so called because of their combined shape.
<i>Wood and Wood</i>	This term implies that, when a treenail is driven through, its point is directly even with the inside surface whether plank or timber.
<i>Worm Shoe</i>	A <i>False Keel</i> . (q.v.). An extra thick layer of timber fitted to and separated from the true keel by a layer of creosote coated industrial felt luted with white lead or a sheet of copper and secured to the true keel by dovetailed spikes.
<i>Wrapping Boards</i>	Also called wrappers. The outer planks on an Ashcroft, double diagonally or double carvel built wooden boat.

<i>Wringhead</i>	The <i>Wrunghead</i> (q.v.). (Obsolete)
<i>Wrunghead</i>	The outer end of the floor futtocks in a built frame. (Obsolete).
<i>Wrunghead Wale</i>	An extra thick piece of skin planking run over the outer ends (or wrungheads) of the floor futtocks. (Obsolete).
<i>Wrunghead Binding Strakes</i>	A pair of skin planks (one in the thick stuff and one in the bottom planking) fitted either side of the wrunghead wale. (Obsolete).
<i>Yacht</i>	A pleasure vessel either sail or power. In American usage the idea of size and luxury is conveyed.
<i>Yarmouth Roads Cupboard</i>	A seaman's name for the cupboard in the open after cabin of a barge and so-called because, when the deck worked at sea, the cupboard (and the cabin) become " <i>as wet as the Yarmouth Roads</i> ".
<i>Yoke</i>	A steel arm laid transversely across the top of the rudder stock on the larger vessels to enable the rudder to be turned using a twin ram hydraulic steering gear. It takes the place of the <i>Tiller</i> (q.v.).

